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SOUTHWESTERN MEDICINE

Official Organ of the New Mexico Medical Society, Arizona State Medical Association, El Paso County (Texas) Medical Society and the Medical and Surgical Association of the Southwest

For Table of Contents—See Advertistng Section Page 1
For Index to Advertisements—See Advertising Section last page

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TABLE OF CONTENTS

ORIGINAL ARTICLES

Page

CARDIAC IRREGULARITIES—(Illustrated) - - - - - - - 39
Dr. E. Avery Newton, Los Angeles, Calif.
REPORT OF A FEW UNUSUAL LUNG INFECTIONS—(Illustrated) - 43
Dr. G. Burton Gilbert, Colorado Springs, Colo.
CONCERNING RADIATION IN PELVIC CANCER - - - - - 47
Dr. Albert Soiland, Los Angeles, Calif.
THE TUBERCULAR (PULMONARY) AS A SURGICAL RISK - 49
Dr. C. E. Yount, Prescott, Ariz.
SOME SIGNIFICANT PROBLEMS IN ANTI-TUBERCULOSIS WORK - - - - - - - - - - - - - - - - - - 56
Dr. Chas. O. Giese, Colorado Springs, Colo.
THE DIAPHRAGM IN PHYSICAL DIAGNOSIS—(Illustrated) - 61
Dr. E. A. Duncan, El Paso, Texas.
CONCERNING THE TREATMENT OF SYPHILIS - - - - - 64
Dr. Chas. S. Vivian, Phoenix, Ariz.
PROTECTIVE MEDICAL MEASURES - - - - - - - - - 68
Drs. Z. Causey and *John F. Martin*, Douglas, Ariz.

EDITORIAL

THE MEETING OF THE TEXAS STATE MEDICAL ASSOCIATION IN EL PASO - - - - - - - - - - - - - - - 74

NEWS

DEATHS - 74
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE - - - - - - - - - - - - - - - - - - - 75
REMOVALS - 76
EL PASO COUNTY SOCIETY - - - - - - - - - - - - - 76

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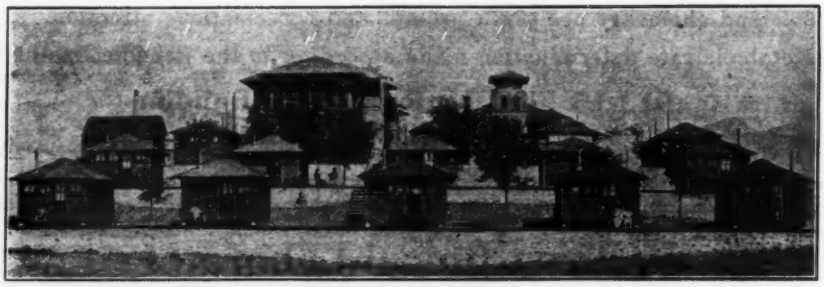

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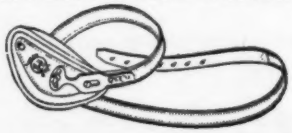

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CARDIAC IRREGULARITIES*

E. AVERY NEWTON, M. D., F. A. C. P., Los Angeles, California.

The normal heart beat in all mammalia originates in the sino auricular node situated at the junction of the right auricle and superior vena cava, owing to this portion of the normal heart being more easily irritated than any other area. The stimulus arising here passes down over the auricles and through the auriculo-ventricular bundle, or bundle of His, and is then distributed to the ventricles, through the arborizations of the auriculo-ventricular bundle, stimulating the contractions of the ventricles.

The normal time of the passage of this stimulus from its origin, in the sino auricular node, until the response of the ventricles is about 17 to 20 hundredths of a second. Electrocardiographically, the response to the impulse arising in the sino auricular node is designated as "P" (Figure I). This is followed in from 17 to 20 hundredths of a second by the ventricular response designated as "R" (Figure I). The broad curve which occurs simultaneously with the second sound of the heart is designated as "T" (Figure I). These responses are followed by a pause or rest period until the next auricular contraction occurs. These three deflections of the string in the same direction, with the intervening pauses or quiescent periods, constitute the normal phases of the heart beat.

Occasionally we have a slight downward movement of the string at the end of the pause between auricular and ventricular response which is designated as "Q" (Figure I). And a downward movement at the end of the deflection "R" (Figure I) which is designated as "S" (Figure I). Slight deflections at these points are not considered as abnormal.

Stimulations arising anywhere outside the sino auricular node, in the heart, which are followed by a cardiac contraction, produce either cardiac irregularities or an abnormal contraction of the heart, with the exception of sinus arythmia, which is due to a non-stable irritability of the sino auricular node, and pulsus alternans, which is an irregular response of the ventricular contractions, as observed by palpation of an artery. Einthoven and Lewis both find no change in the electric contractions, nor any irregularity of rate in pulsus alternans.

The cardiac irregularities usually met with are: Sinus Arythmia, Heart Block, Auricular Fibrillation, Auricular Flutter, Paroxysmal Tachycardia, Extrasystoles, and Pulsus Alternans.

SINUS ARYTHMIA

Several related heart irrgularities are due to variations in the rate at which

*Read at the Thirtieth Annual Session of the Arizona State Medical Association at Tucson, April 15-16, 1921.

the impulses are generated at the sino auricular note. A notable example is the irregularity of respiratory origin with which you are familiar. In this disturbance there is a gradual acceleration of the rate during inspiration and a slowing of rate during expiration.

In young subjects this is a normal phenomenon. During early life irregularities in which the whole heart participates and in which there is no constant relation to breathing, are seen. These irregularities are considered by many to be of normal origin. I believe they indicate lowered vitality. They are probably brought about by vagal disturbances.

Electrocardiographically, they are easily recognized. The electric curve is usually of normal form in which the auricular and ventricular elevations are seen. The irregularity is only in the rest period between beats (Figure II, leads 1 and 2), otherwise the normal rate of contractions of auricles followed by ventricles is observed.

Irregularities of sinal origin are easily recognized. Most of the irregularities in childhood are of this kind and a majority of them are respiratory. They disappear in most instances on exertion or a slight rise in temperature, or by any cause that will increase the pulse rate. Also soon after the administration of small doses of atropine.

HEART BLOCK

Heart-block is partial, to complete, dissociation of the auricles and ventricles.

Partial heart-block may be an occasional prolongation of the time it takes the impulse originating in the sino auricular node to reach the ventricles, there being regular auricular contractions, to some of which there is no ventricular response (Figure IV).

Partial heart-block is of considerable clinical importance (Figure III); when continued for some time it tells of myocardial degeneration; when present for a short time only, of poisoning or acute heart lesions.

When in conditions such as acute rheumatic fever, cholecystitis, cystitis or other chronic infections, you find the heart dropping a beat and it proves to be a partial heart-block, you can be sure the heart is being invaded by the bacterial organism or its products, and heroic treatment should follow.

Complete heart-block is the complete dissociation of auricles and ventricles (Figure IV). The auricles maintain their regular rhythm of from 66 to 80 per minute. The ventricles have taken on a rhythm of about 30 to 40, which is of ventricular origin.

If the ventricles did not contain some areas of primary cardiac tissue in which stimulus to contractions could and does originate, death would always follow the destruction of the auriculo-ventricular conducting bundle, as the ventricles would not functionate unless they had this property within themselves when no impulses originating in the auricles reach them.

AURICULAR FIBRILLATION

Auricular fibrillation is a condition in which co-ordinate contractions of the auricles have ceased. There is a constant twitching all over these two chambers. They are in constant dilatation and cease to perform their function of propelling blood into the ventricles. Electrocardiograms of this condition show auricular contractions of from 400 to 600 per minute.

This condition is very important owing to its frequency, ease of diagnosis, prostration of subject and yielding to treatment.

It is the old pulsus irregularis perpetuans which you have all seen, from which digitalis gained its fame and is most useful, being the only drug helpful in these cases.

AURICULAR FLUTTER

Auricular flutter is a condition of auricular acceleration in which the auricles contract at a rate of from 200 to 300 per minute. This rate is more rapid than the ventricles can follow, so that we usually have a heart-block in which every second or third auricular contraction stimulates a ventricular contraction (Figure VI), or any rate of block, may be present.

We may have an auricular contraction between the one to which the ven-

tricles respond and the ventricular response (Figure VI, lead 3 "aaaa").

This condition, as also fibrillation and tachycardia, occurs mostly in old people in whom there is myocardial degeneration, or in whom there is nutritional disturbances, as following influenza, etc.

If the heart muscle is markedly degenerated, we are apt to have cardiac dilatation, engorgement of the liver and dropsy.

If the heart is well supplied with energy, no embarrassment may be seen.

Inability of the patient to do work requiring much energy, and frequent attacks of tachycardia, occur. The response to treatment is the best guide to prognosis.

PAROXYSMAL TACHYCARDIA

Until recently paroxysmal tachycardia was thought to be due to very slight disturbances of cardiac innervation.

The electrocardiograph has shown the condition to be quite different.

The impulses originate outside the normal location or sino auricular node, usually in the auricles (Figure VI; note the difference in ventricular responses in leads 1 and 2) whereas, in rapid heart action following exertion, fever or emotion the beats arise in the physiological area and are only more frequent.

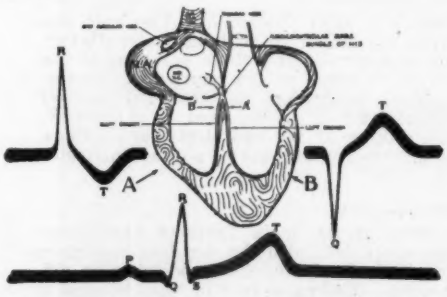

Fig. VII.—*Modified Diagram after Lewis.* At the lower part there is a schematic drawing of a normal electrocardiogram. The drawing at the left represents what occurs electrocardiographically from stimulating the ventricle at "A," or if the auriculo-ventricular bundle is severed at "Á." At the right is shown what occurs when the ventricle is stimulated at "B" or the bundle is severed at "B'," showing right and left ventricular extrasystoles artificially produced.

EXTRASYSTOLES

Extrasystoles are responsible for most irregularities of the heart, especially the so-called "missing of a beat" you so often have patients tell you about. They occur at irregular intervals. I have seen them occur as often as every second beat (Figure VIII) and at all other intervals up to as many as 500 beats before another one appeared. Unless they occur often, they give very little real discomfort, except to the patient, who will count his pulse and become alarmed when it misses.

While they may arise in any part of the cardiac tissue, they are usually ventricular in origin. They usually occur just following systole. The next auricular contraction occurs while the ventricle is active (Figure VIII, leads 1 and 2); therefore, there is no ventricular response to this auricular contraction, as the heart muscle will not respond to more than one stimulus at a time. The pause following the extrasystole is called a compensation pause.

Right ventricular extrasystoles give an upward deflection (Figure VIII), while one arising in the left ventricle gives a downward movement of the string (Figure IX.)

Regardless of their form or origin, they are almost harmless and are only to be diagnosed to exclude some really serious condition such as heart-block and fibrillation. Electrocardiographically, this is easily done; by any other means there is often some difficulty.

I have always found them present following acute dilatations, which I attribute to the ventricular muscle being more easily irritated following this condition.

The same tissues in the ventricles which take on the origin of a ventricular rhythm in heart-block are the ones which become irritated and produce extrasystoles.

They occur frequently in intestinal disturbances, due usually to some products of putrefaction being absorbed into the tissues. All having this origin are cured by a laxative, especially a good dose of calomel.

PULSUS ALTERNANS

When we find an alternation in the arterial pulse by palpation which seems to be very marked, electrocardiograms do not show any evidence of it.

When, however, this condition is associated with tachycardia, slight variations of the "P" and "T" amplitude are present.

DESCRIPTION OF PLATES

Fig. I. *Normal Electrocardiogram.*

Time in seconds, showing the auricular deflection "P" and the ventricular deflections "Q," "R," "S" and "T." The leads in this and all other illustrations are indicated at the left in Roman figures.

Fig. II. *Sinus Irregularity.*

This occurs in Leads 1 and 2. In Lead 3, the heart rate is regular. Lead 1 shows lowered electric response. Leads 2 and 3 show marked left ventricular preponderance. This electrocardiogram is from a case of marked left ventricular hypertrophy.

Fig. III. *Delayed Conductivity* and *Sinus Irregularity.*

Prolongation of the P-R intervals to .3 of a second. In Lead 1 there is a delay in auricular contractions and in auriculo-ventricular conduction time, heart rate 50 per minute. In Lead 2 the third beat is much delayed, while beats 1 and 2 are at the normal rate. In Lead 3 the second beat is delayed, the third beat follows at the normal interval, and the first portion of the fourth beat shows delay in auricular contraction. Partial heart block, the irregularity arising at the sino-auricular node.

Fig. IV. *Complete Heart Block.*

Entire dissociation of auricular and ventricular rythms. Auricular rate 79 per minute. Ventricular rate 34 per minute. Notice the superimposing of auricular, of "P" complexes, on the ventricular complex.

Fig. V. *Auricular Fibrillation.*

In Lead 1, we have irregularity in rate of ventricular contractions, as well as in height of "R" summits, showing unstable or irregular electric generations. In Leads 2 and 3 we have a constant series of auricular contractions—"a." In Lead 2, the last ventricular response to the right is of different origin than the preceding four. In Lead 3, the first and last two ventricular responses are similar, the second and third are different in form, the fourth following a long pause is of another form, showing that in this lead the ventricles have responded to impulses arising from three distinct areas.

Fig. VI. *Same Case as Figure V.*

This electrocardiogram was made immediately after Figure V. The rate has markedly increased. A paroxysmal tachycardia has developed with auricular flutter, the auricular contraction occurring at the rate of approximately three auricular to one ventricular contraction. In Lead 3 there is one instance of four auricular contractions ("a") between ventricular responses. Note the marked difference in form of ventricular responses in this electrocardiogram from what occurred in Figure V. There was less than five minutes between the taking of the two electrocardiograms. At the time Fig. VI was taken, all the ventricular responses were of supra-ventricular origin.

Fig. VIII. *Extra Systoles.*

This electrocardiogram illustrates one form of the more frequent ventricular extrasystoles or premature contraction of the ventricles; also the regular occurrence of extrasystoles following every normal beat. This illustrates the importance of differentiating between heart block and extrasystoles. The pulse rate in this instance is 44, with 88 cardiac contractions, the extrasystoles occurring early in diastole before the ventricles have had time to fill. There is no pulse wave produced. The auricular contraction which occurs during the time the ventricles are in action does not produce a ventricular contraction, as muscle does not respond to more than one stimulus at a time. This beat arises in the right vasal area of the ventricles.

Fig. IX. *Extrasystoles.*

Lead 1 represents extrasystoles arising in the left ventricle. In Lead 2, the third or center beat is of right ventricular origin. In each instance the "P" wave occurring during this contraction does not produce a ventricular response.

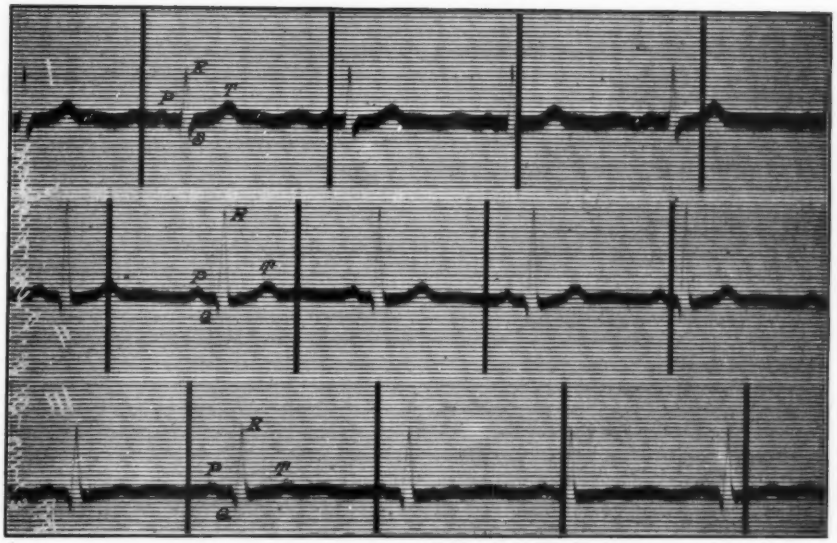

Fig. I. *Normal Electrocardiogram.*

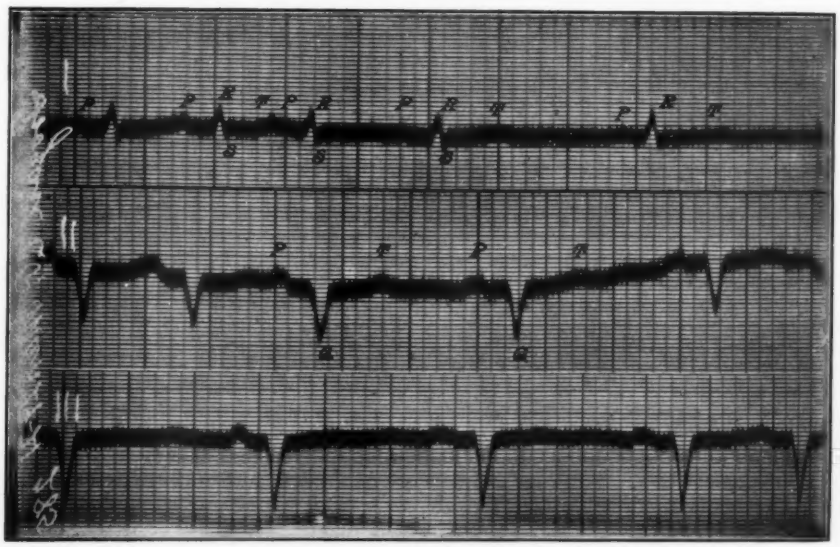

Fig. II. *Sinus Irregularity.*

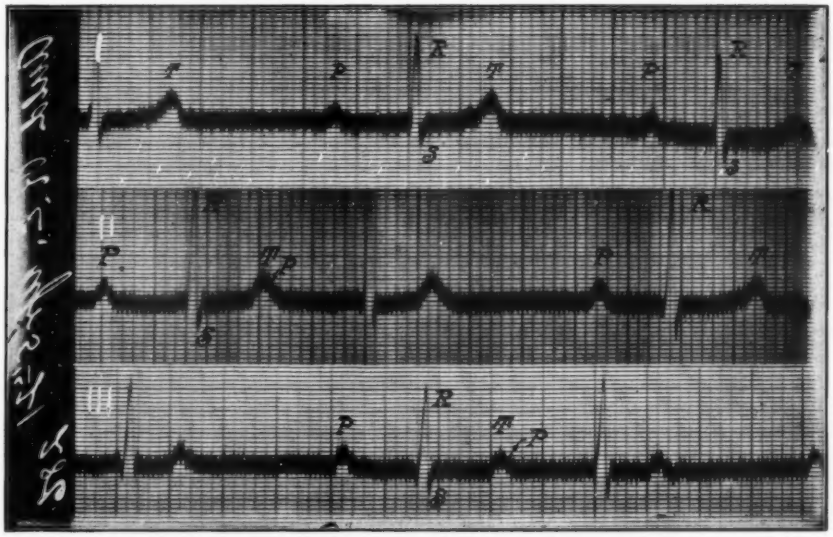

Fig. III. *Delayed Conductivity* and *Sinus Irregularity.*

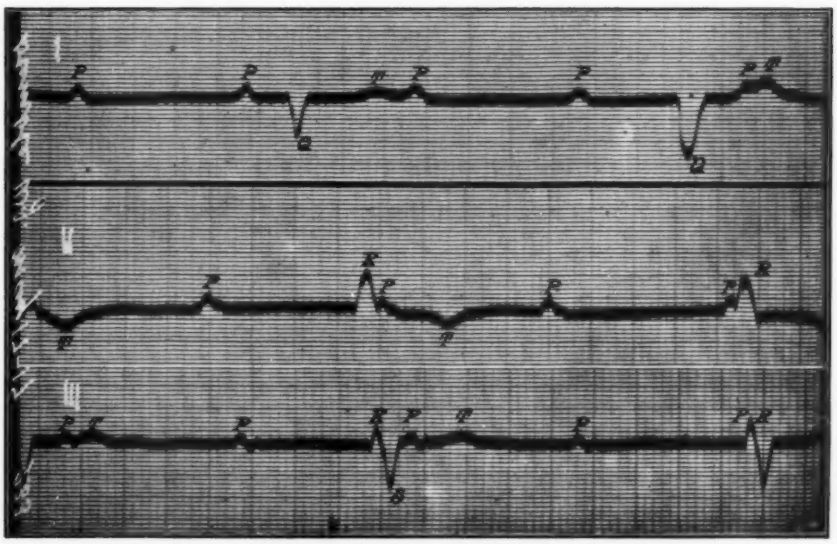

Fig. IV. *Complete Heart Block.*

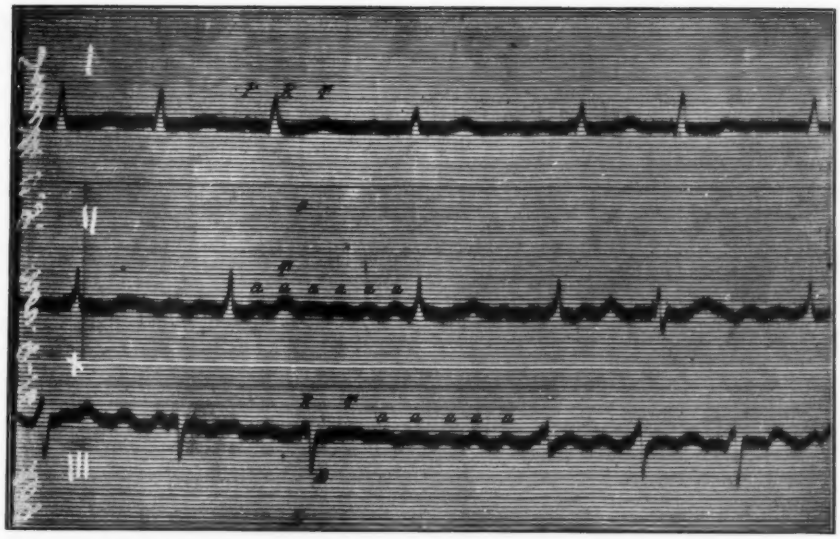

Fig. V. *Auricular Fibrillation.*

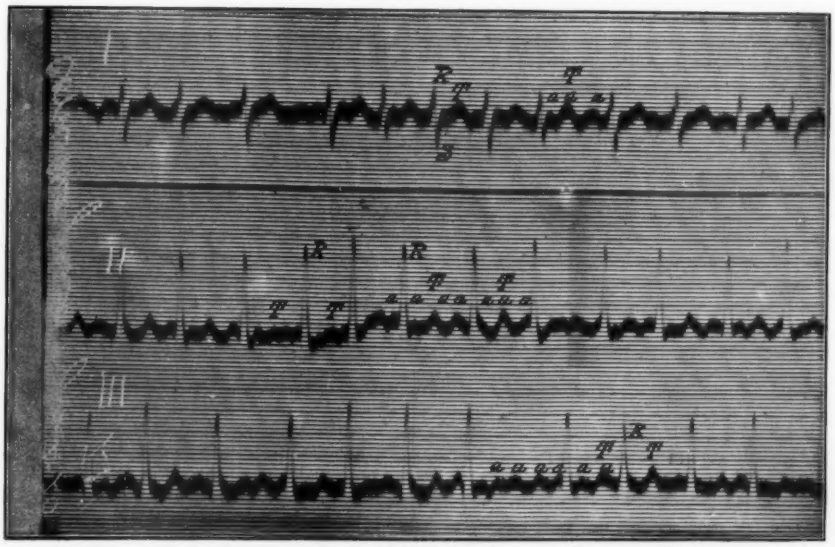

Fig. VI. *Same Case as Figure V.*

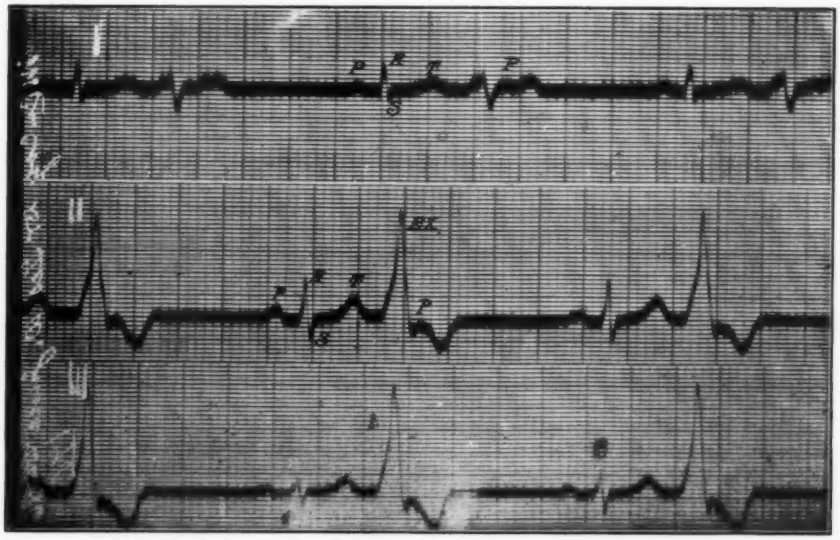

Fig. VIII. *Extra Systoles.*

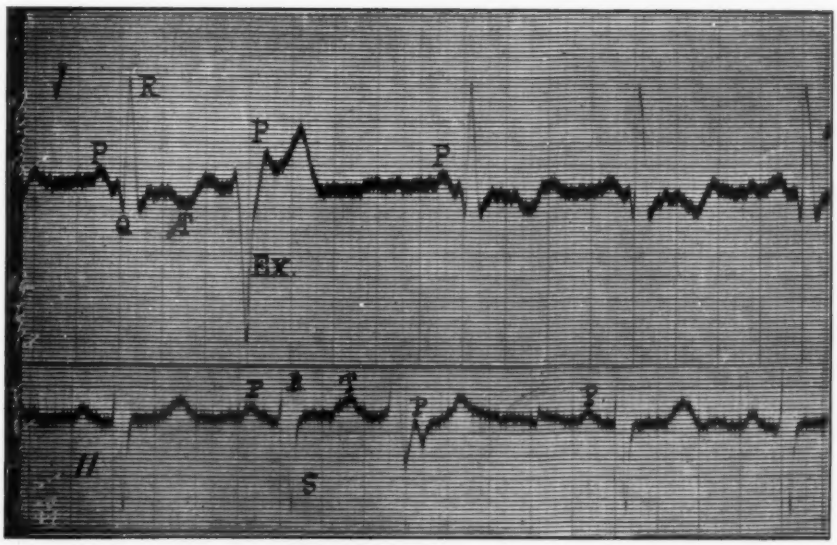

Fig. IX. *Extrasystoles.*

REPORT OF A FEW UNUSUAL LUNG INFECTIONS*

G. BURTON GILBERT, M. D., Colorado Springs, Colorado.

For many years we have all heard a great deal about the diagnosis of pulmonary tuberculosis. But it is only during the last few years that we have begun systematically to focus our attention on the diagnosis of non-tuberculous disease of the lungs. More and more we have been forced to realize that every case with sputum which is constantly negative for tubercle bacilli demands further search for the etiological agent. Pulmonary abscess, following tonsil operations and pneumonia, has become surprisingly common. Chronic bronchitis and bronchiectasis, which, as we have recently pointed out, are almost always associated with sinus disease have very frequently come to Colorado diagnosed as tuberculosis. Over 50 cases presenting this combination have been worked out in our office in the last two years. No small number of cases of carcinoma and other tumors have been found in lungs supposed to be tuberculous. Hyperthyroidism has added materially to the number of mistaken diagnoses.

Today, I wish to invite your attention to a few unusual lung infections, which may produce symptoms and signs exactly similar to those of pulmonary tuberculosis. I refer to primary infections with pathogenic moulds, fungi and spirochaetae. With your kind indulgence I will report in some detail a case each of Aspergillosis, Blastomycosis, Stretothricosis and Syphilis of the lung.

Case I. Mrs. S., age 35, came to Colorado from Indiana in May, 1920, with a diagnosis of pulmonary tuberculosis. Complaint, shortness of breath and cough. F. H.—Her paternal grandfather died of tuberculosis 30 years ago. Her mother had slight tuberculosis some 25 years ago with complete recovery. P. H.—Patient had typhoid fever at age of 11, scarlet fever at 21, and tonsillectomy 3 years ago. Ten years ago, after hard instrumental delivery, was much run down and had pleurisy pains, slight cough and some loss of weight but no fever or sputum. At this time she was said to have tuberculosis, was given tuberculin and made a good recovery in California.

P. I.—Present illness began in January, 1920, with shortness of breath, cough, expectoration, rapid pulse, weakness and loss of 10 pounds weight in three months. Temperature was sub-normal. She showed no improvement from a rest cure of four months at home, so came to Colorado and entered Cragmor Sanatorium.

P. E.—Examination showed slightly impaired resonance over the upper portion of both lungs to the 4th rib and 8 v. s. with prolonged high-pitched expiration to the 2nd rib and 6 v. s. Fine and medium coarse rales were very numerous over the entire left lung and to the 5th rib and 8 v. s. on the right. Many of the rales were bubbling in character. Trachea was to the right by palpation. No enlarged glands.

X-rays of sinuses were negative.

X-ray of chest (Fig. 1) showed slightly increased peribronchial markings upward and outward from each hilus. Haemoglobin 80%. Total leucocytes 8,000; polymorphonuclears 68%. Wassermann and Complement Fixation for tuberculosis, both good negatives. Urine normal.

Sputum mucopurulent, about 2 ounces daily; many examinations were always negative for tubercle bacilli. Guinea pig inoculations did not produce tuberculosis.

In September, 1920, the patient returned to Indianapolis for a visit and while there Dr. C. P. Emerson succeeded in growing a pathogenic mould from her sputum (in pure cultures). This proved to be the Aspergillus Fumigatus, which we have since cultivated repeatedly from the fresh sterile sputum. In order to complete the identification of the organism spores should be injected into the ear of a rabbit, which will die in a few days of a general infection and show typical tubercles in the internal organs.

This patient has been given rest, fresh air, good food and tonics. Also small doses of potassium iodide, altho she does not tolerate this drug well.

Up to the present time neither the signs nor symptoms have changed materially. The disease is apparently not

*Read at the Thirtieth Annual Session of the Arizona State Medical Association at Tucson, April 15-16, 1921.

progressing, altho there are no signs of improvement.

COMMENT: The marked symptoms and extensive signs in the lungs compared to the few changes seen in the x-ray film (Fig. 1) are rather striking. The diagnosis could be made only by finding the organism in the sputum. These mould infections are sometimes secondary to tuberculosis. Bread moistened in milk, then autoclaved in a petri dish, furnishes a good culture medium.

Case II. Mr. G., age 39, laborer in a grain elevator in Kansas, was sent to the Modern Woodmen Sanatorium with a diagnosis of tuberculous laryngitis. Family and personal history are good.

Present illness began 3 months before admission with a severe cold and tonsilitis which settled in his larynx. He had to stop work one month ago because of weakness and loss of weight. On arrival there was slight dullness over the left apex, but no rales. Hoarseness was marked and there was pain in the ear at times. On the right tonsil were two small pin-point yellowish spots. The epiglottis was eroded in a V-shaped ulceration extending well on to the tongue. The entire mucous membrane of the larynx and cords looked as if they had been treated with silver nitrate. There were many small, slightly elevated, pin-point yellow spots, altho there was not much infiltration. A piece of tissue was removed for diagnosis. When sectioned, this showed many small abscesses containing the typical spherical, budding, encapsulated parasites of Blastomycosis. A few blastomyces were found in a smear from the larynx.. Wassermann test was negative. Total leucocytes averaged 20,000 with 75% polymorphonuclears. Urine contained a trace of albumin and a few granular casts. Afternoon temperature averaged 99.4°. No skin lesions appeared. Patient was given potassium iodide in large doses but the laryngeal lesion continued to progress until a tracheotomy had to be performed and he was later fed by a tube. Dullness increased over the left lung, but there were very few rales. X-ray (Fig. 2) at this time (7 months after entering the sanatorium) showed very extensive general mottling on both sides, greatly in excess of that indicated by the physical signs. He died 5 months later, but no autopsy could be obtained.

COMMENT: The symptoms suggested tuberculosis, altho the laryngeal lesion did not look like tuberculosis. The lung signs were very few compared to the x-ray findings, which suggest the pathological picture of miliary and pea-sized abscesses coalescing to form larger areas with softening. The respiratory tract is the common portal of entry for the Blastomyces in all systemic cases of the disease.

Case III. Mr. H., farmer from Iowa, age 24. Family and personal history good, except had pneumonia at 14 years of age and pleurisy on the left side two years ago.

Present illness began with hemorrhage of an ounce. Had some cough expectoration, and shortness of breath, but no loss of weight or strength. Went to New Mexico and was treated with tuberculin. On arrival at the Modern Woodmen Sanatorium examination of the lungs showed lagging of the left side, dullness over the left lower lobe with many fine and coarse rales over the left base. Vocal fremitus and whispered voice sounds were increased over an area 2x3 inches in the lower inner portion of the left back. Breath sounds were decreased above and almost bronchial below the 4th rib on left side near the sternum. Trachea and heart were considerably displaced to the left. Temperature touched 99 afternoons but pulse was normal. Weight 167. Sputum thick yellow about 2 ounces daily. Tubercle bacilli were never demonstrated by any method. When he had been in the Sanatorium 4 months, characteristic granules were found in the sputum and typical streptothrix were stained and grown on gentian violet agar. Altho he was given potassium iodide, the signs in the left lung continued to increase until there was dullness and moist rales throughout. X-ray (Fig. 3) shows density throughout left side especially opaque over base with no lung markings evident. Patient returned to Iowa and when last heard from 3 years after discharge was still alive, altho gradually failing in health.

COMMENT: Pathologically, there is marked tendency to extensive necrosis followed by tremendous scar tissue formation and great pleural thickening, the lesions usually being situated in the lower lobes. Certain varieties of streptothrix are more or less acid and alcohol-fast and may occur as short rods rather than the usual branching mycelium with ovoid spores. Claypole has originated streptothrichins (concentrated glycerinated bouillon cultures of these organisms) which are used intradermally for purposes of diagnosis. These organisms take the gram stain well. Nocardia is perhaps a better name for them.

Case IV. Mr. C., age 38. Entered Cragmor Sanatorium in October, 1919, with a diagnosis of pulmonaray tuberculosis, altho tubercle bacilli had never been found in his sputum. During the few preceding months he had had several slight hemorrhages, considerable hoarseness, marked malaise, some dyspnea,

cough and expectoration. Temperature and pulse were normal. Examination of the lungs showed markedly impaired resonance and quiet breath sounds over the right upper lobe with slight dullness and absent breath sounds over the right base. No rales. Fluoroscopic examination showed a small amount of fluid in the right pleural space. Wassermann test was positive.

Patient gave a history of leutic infection 12 years previously—this had been treated by mercury for two years, off and on. He was given an intravenous dose of arsphenamin, .6 gm. During the next two days he had several hemorrhages of an ounce, and a slight fever. A little later he was given large doses of mercury hypodermically and all symptoms disappeared, altho he was badly salivated and lost several teeth. The lung signs cleared materially, altho he has taken little treatment since the salivation and disappearance of symptoms. The x-ray films (Figs. 4, 5, 6) show the condition before and after treatment. During the last two months, altho apparently well, he has received six full doses of arsphenamine in an effort to obtain a negative Wassermann test. He showed no reaction to any of these injections.

Case V. Mrs. V., colored, aged 39. Complaint: shortness of breath, violent cough and weakness. P. H.—Has had three husbands during the last 21 years. Two children, ages 18 and 20, living and well. Vaginal ulcer 17 years ago. Three miscarriages; first one fifteen years ago, and last one 2 years ago—all about the fourth month. In 1919 had a deep ulcer in the roof of mouth which lasted several months.

P. I.—Began in April, 1920, with a hard, dry cough, which later became productive. Soon began to wheeze and complain of shortness of breath, which grew steadily worse. Lost 15 pounds in weight and had slight fever by spells. During coughing spells often had sharp, stabbing pain at base of right lung extending through to back. Had several sudden suffocative attacks and was treated for asthma for some months by several physicians. By September, 1920, when she entered the Glockner Hospital, she had to sit up all the time and was often gasping for breath and very weak. She raised considerable thick yellow sputum which was always negative for tubercle bacilli. Marked inspiratory and expiratory dyspnoea were present.

P. E.—Lungs showed impaired resonance over the right side, especially posteriorly. Breath sounds were very distant and practically absent at times over the upper portion of the right lung but clear and distinct over the left side. Vocal fremitus much diminished over right upper. There were many squeaks and rhonchi on the right side and some over the left base in front, but no fine rales. No palpable cervical glands. Reflexes active. Eyes react normally.

B. P.—190 systolic, 120 diastolic. Heart, normal position and slightly enlarged. Second aortic sound accentuated. No murmurs. Pulse 100. T. 98.4. Urine negative. Hb. 80%. Total leucocytus, 9,000. Polys. 51%. No eosinophiles. Wassermann test positive. X-ray lungs (Fig. 7) shows ragged increased density outside the right hilus with considerable fibrosis on the upper half of the right lung. X-ray tibiae show marked thickening of periosteum.

Diagnosis — Syphilitic tracheo-bronchial stenosis.

Treatment—Bichloride of mercury and potassium iodide were given in increasing doses with very rapid improvement in symptoms and signs.

At the present time patient is short of breath only if she walks fast or far. Has gained much weight and strength. Does not cough, but raises a little clear sputum in the morning. Breathes easily and noiselessly. Breath sounds are very clear and distinct over both lungs. Vocal fremitus is normal and there are no rales or rhonchi in either lung. Wassermann is a weak negative.

Recent x-ray of lungs (Fig. 8) shows marked clearing of pathological densities.

COMMENT: Cases of syphilis of the lung will not be such a rarity when physicians generally recognize the possibility. All cases with lung symptoms or signs without tubercle bacilli in the sputum who do not do well under sanatorium regime should be investigated for syphilis. Points in the diagnosis are the history of exposure or infection, or of luetic symptoms, the presence of other leutic lesions in the body, especially arterial changes and thickening of periosteum of the long bones, a positive Wassermann test and the results of treatment. Or course, syphilis and tuberculosis may, and frequently do, coexist in the same patient. In our experience 6% of the cases of pulmonary tuberculosis also have syphilis.

DESCRIPTION OF PLATES

Fig. 1. *Aspergillosis.*

Case I. Very slight radiographic findings with marked physical findings.

Fig. 2. *Blastomycosis.*

Case II. Radiographic findings greatly in excess of physical findings. Diffuse, irregular, coalescing densities, somewhat resembling an acute tuberculosis.

Fig. 3. *Streptothricosis.*

Case III. Total density of left hemithorax, with no lung markings. Density of right apex.

Fig. 4. *Syphilis.*

Case IV. Diffuse density of right side of chest, with an irregular, ragged density, continuous with heart border. Radiograph made in October, 1919.

Fig. 5.

Case IV. Same as Fig. 4, taken Feb. 24, 1920, showing partial resolution of the irregular infiltration and the upper lobe density.

Fig. 6.

Case IV. Same as Figs. 4 and 5 taken Feb. 17, 1921. Complete resolution of the irregular basal densities, with linear fibrosis in the upper lobe.

Fig. 7. *Syphilis.*

Case V. Ragged density at right hilus, with fibrosis in upper right lobe. Radiograph taken Aug. 28, 1920.

Fig. 8.

Case V. Same as Fig. 7. Taken Jan. 22, 1921, showing marked clearing of pathological densities after specific treatment.

Fig. 1. *Aspergillosis.*

Fig. 2. *Blastomycosis.*

Fig. 3. *Streptothricosis.*

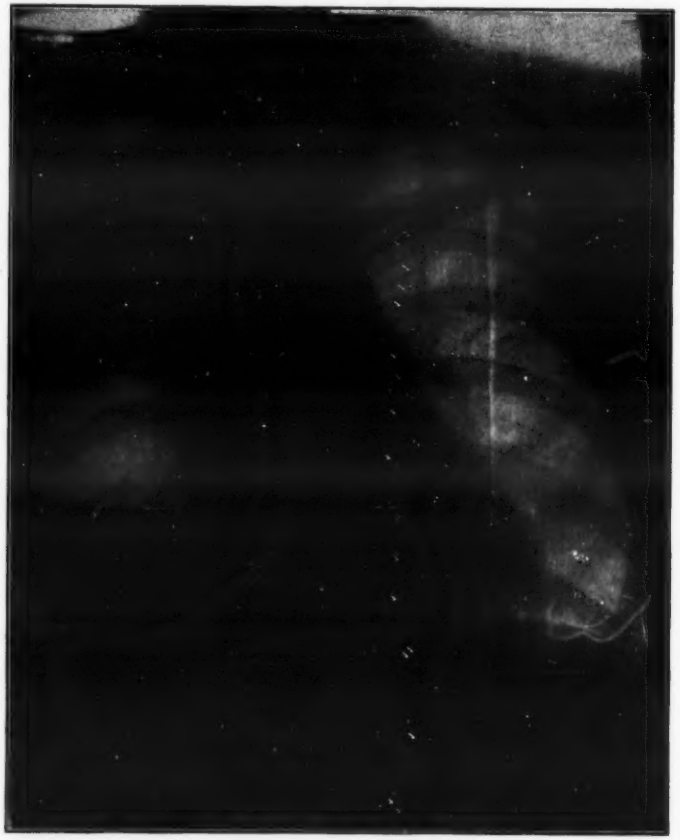

Fig. 4. *Syphilis.*

Fig. 5.

Fig. 6.

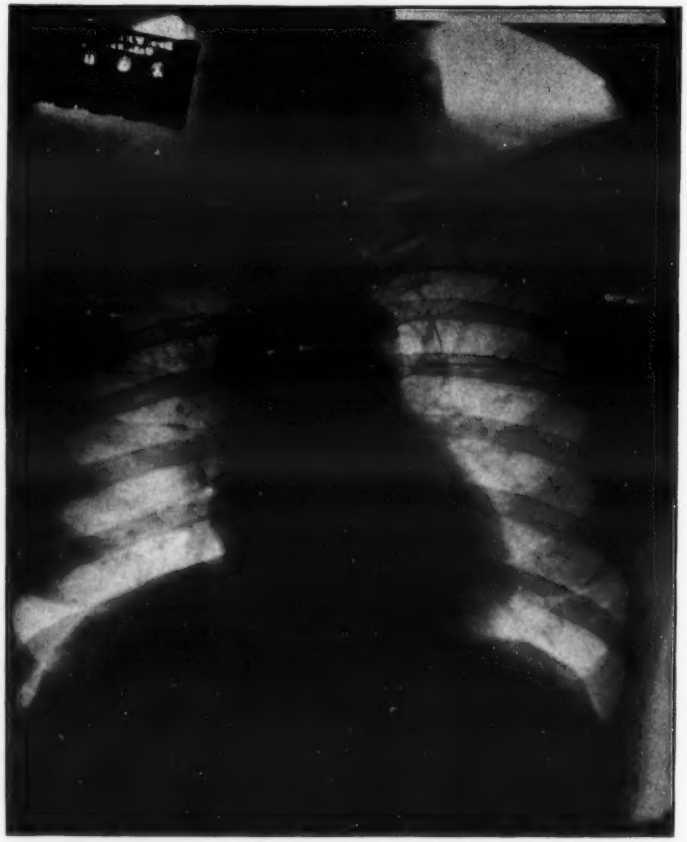

Fig. 7. *Syphilis.*

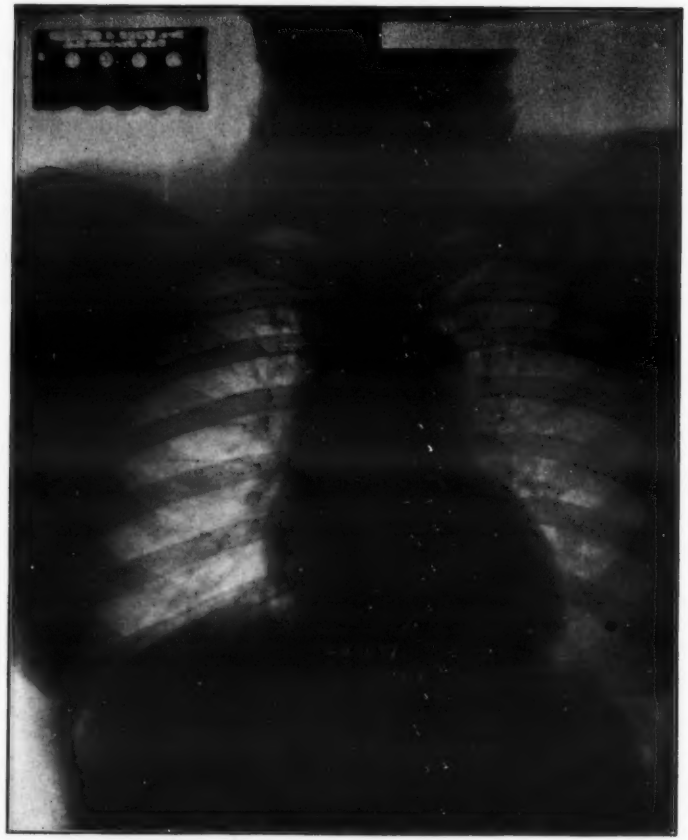

Fig. 8.

CONCERNING RADIATION IN PELVIC CANCER*

ALBERT SOILAND, M. D., F. A. C. P., Los Angeles, California.

Medical literature is not at all unanimous in its conclusions as to the exact status of radiation in pelvic cancer, and this is the writer's excuse for presenting certain impressions gained from his long experience in this work, as well as those based on his observations in many clinics.

European operators, particularly English, French, Scandinavian and German, have, up to the present time, been much more active, if not further advanced, in this work than American physicians. Our foreign confreres on the whole give more favorable case reports than observers at home.

It will scarcely be necessary to go into the biologic effect of radiation, as this is no doubt familiar to you all. We will accept the theory that certain ineffectual radiation may act as a stimulus to a cancer cell, and, under favorable circumstances, actually promote the growth of these cells; yet, in so far as the writer knows, there are no authentic cases on record which prove the truth of this belief. There can be no question that such disasters may occur, but, conversely, there is neither any doubt that a more intense or prolonged radiation not only inhibits but actually destroys, primarily, the nucelus and, secondarily, the body of any aberrant or malignant cell that is so exposed.

The rationale of radiation is to study individually each case submitted for treatment and to apply to that case the particular amount of ray energy that will best cope with the condition present. There are well-defined indications to cover specific cell lesions where definite results may be confidently expected, in a more or less limited group of cases.

It is my desire to make it clear that in this paper I shall not discuss surgical treatment in any detail but will refer to it solely from the viewpoint of the radiologist, who has had ample opportunity to study end results and work out conclusions with competent surgeons.

All cases which are favorable operative risks should, of course, be given the benefit of the best surgical skill available. In cases, however, where an operation is not feasible, sufficient evidence has been collected to say justly that there is now no longer any excuse for withholding radiation. Further, I am willing to assert that cancer of the uterus, advanced to a point where diagnosis is unmistakable, is practically incurable by any means in our present armamentarium, and that includes surgery. On the other hand, the most advanced carcinoma of the uterus can be distinctly and materially benefited by radiation, in so far as inhibition of distressing symptoms are concerned.

Borderline cases should be given radiation and treated as if dealing with carcinoma.

In carcinoma of the cervix, I believe it is possible to effect a cure in a certain proportion of cases. Our object in dealing with cervical carcinoma should be to destroy every malignant cell with radium, as quickly as possible. If this is done before the glandular channels have been invaded, there is fair prospect of a cure.

My technique for a cervical carcinoma usually consists of an implantation in the cervix of 50 milligrams of radium element, with filter of one-half millimeter of silver, one millimeter of brass and one millimeter of hard rubber, for fifteen hours, giving four such applications within six days' time. This is a total of three thousand milligram hours, which is sufficient to destroy carcinomatous cells within a radius of three centimeters in all directions from the center of application. This treatment is followed by x-radiation over the

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lower abdomen, through four ports of entry, giving a total of six hundred milliampere-minutes in a period of six days.

In cancer of the body of the uterus, the technique is practically the same, except that radium is carried up to the fundus, if possible. If this cannot be accomplished, radium is packed in an additional two millimeters of hard rubber filter, the rectal wall is protected with two millimeters of lead, and the entire mass inserted into the posterior cul de sac, additional tubes are placed in each fornix, and the exposure carried up to six thousand milligram hours within six days' time. The x-ray crossfire is directed through six ports of entry on the abdomen, giving a total of 900 milliampere-minutes with ten millimeters aluminum filter, ½-inch cotton filter, under compression, one hundred kilovolts, five milliampere tube circuit, at an eight-inch skin distance.

The European operators are using a much more radical procedure. They have perfected transformers, claimed to develop two hundred kilo-volts, and with especially designed hot cathode, and water-cooled tubes obtain a high degree of gamma-radiation. The patients are subjected to many hours' treatment, and suffer great bodily discomfort, frequently exceeding the shock of prolonged surgical operations, but actual cures are recorded.

If one is to accept reports emanating from some of these radiation centers, it is apparent that a great step forward in the treatment of uterine malignancies has been accomplished. American engineers are busy now developing similar aparatus, which, in a reasonably short time, it is hoped will be available to the American radiologists.

With reference to malignant conditions, the whole question of operability is indeed a grave one. This is especially emphasized by the fact that consent to operative procedure is not now so readily given by the surgeons who formerly operated quite freely, upon cases under discussion.

The writer believes that thermic coagulation and electrical dessication will largely supplant the knife in borderline and clearly operative cervical cases. If one can be sure that the growth is confined wholly to the uterus, a careful hysterectomy is the proper procedure. In such cases the surgeon and the radiologist should cooperate.

Let us urge, whenever possible, a routine procedure along these lines. The radiologist makes an intra-uterine preoperative radium application. The surgeon operates from five to seven days later, and the radiologist follows the operation immediately with radium in the vagina, x-ray over the abdomen in the usual post-operative method. In the belief of the writer, such a procedure is the best combination that we have at the present time to combat uterine malignancy.

THE TUBERCULAR (Pulmonary) AS A SURGICAL RISK*

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Calot's dictum, "Le bistouri, c'est l'ennemi"[1] of the surgical tubercular would seem to challenge all surgeons operating tuberculars.

Quite the opposite thought came from W. W. Keen in 1906, when he said that, "surgeons have not been very active in what I regard as the most magnificent crusade of the last ten years, the crusade against the great white plague * *. It has been chiefly by the physicians. We surgeons have been derelict in our duty because we have not come to their help in the matter of surgical tuberculosis as we should have done."[2] The prodigality of the literature covering every phase of the surgical study of hyperthyroidism as compared to the paucity of literature on the tubercular as a surgical risk, would indicate that the words of Keen had fallen upon stony ground.

In comparing the tubercular who requires surgery with the case of hyperthyroidism who can be relieved only by surgery, I have not chosen that which by comparison is, "irrelevant, immaterial, and not pertaining to the question"; in fact, I go so far as to predict that our latest laboratory apparatus,—the metabolism measure,—will, if applied with the same assiduity and zeal to the study of the tubercular, reveal an interesting comparison in the two types of toxicosis. Again, as thyrotoxicosis by reason of its extra-hazardous effect has spurred the profession to evolve a most scientific exactitude combined with the highest surgical skill in dealing with it, so in turn, should the surgical tubercular with equal right share in the application of these scientific attainments.

For those of us who practice medicine and and surgery in the Southwest, conditions are changing. Osler said in 1912,[3] in speaking of the climatic treatment of tuberculosis, "among high altitudes in the United States, the Colorado resorts are the most important. Of others, those in Arizona and New Mexico have been growing rapidly." The tubercular has been seeking a "cure" in the new Southwest for over two decades. With the end of the world war, the United States found herself with 70,000 tuberculars to care for. Thousands of these ex-soldiers are now "chasing the cure" in that region whose reputation for "cures" is "growing rapidly." Thus the whole southwest is becoming known as a resort; the smallest villages, and the outlying ranches are being occupied by tuberculars. This influx of tuberculars has imposed and will continue to impose upon the profession of the Southwest a special knowledge of this disease, and it is incumbent upon us to "be prepared" and to measure up to every requirement of the tubercular's multifarious medical and surgical needs.

For the purpose of this paper, by "tubercular" will be understood the arrested, quiescent and active cases of pulmonary tuberculosis.

We do not include cases of extensive activity, for while these may and frequently do require surgery, which they will receive when it is sufficiently urgent, their lung condition being very probably hopeless, the ultimate result will be death from pulmonary tuberculosis regardless of the surgery. To this latter class, however, when operated, will be applied all the principles of safety promulgated for the first group.

What are the factors which determine the risk in the tubercular? They are exactly those which determine the risk in any operative case, plus a chronic mixed infection of the lungs. As anesthesia of some form is necessary to render every patient operable, it follows that inhalation anesthesia, when used, must be an important factor in

*Read before the joint meeting of The Medical and Surgical Association of the Southwest and the Pacific Coast Roentgen Ray Society, at Phoenix, Arizona, December 2, 1921.

prognosis where latent, acute or chronic infection of the lungs exists. Leonard Freeman, of Denver,[5] has observed that the lungs may be of more importance than the heart in determining the surgical risk.

F. H. McMechen, [16] presumably voicing the opinion of the National Anesthesia Research Society in his address before the Chicago Medical Society in October, argues that, "Because fatalities still occur with undiminished regularity, under both local and general anesthesia, even in the practice of the most experienced surgeons and anesthetists, it becomes vitally necessary to formulate some routine plan by means of which not only the patient's fitness to take an anesthetic may be determined in advance, but also, and more especially how anesthesia may be given with the utmost safety to such hazardous risks." The work of this society is along helpful lines; they can even now report progress; we hope to gather much of value concerning the tubercular in their future reports.

From our review of the literature we deduce that there are three schools concerning the anesthesia of choice in operating tuberculars: (1) Those using ether or some combination of it; (2) those using nitrous oxide gas and oxygen; (3) those using local, regional and spinal anesthesia. There are most excellent men, experienced operators and anesthetists in each school, each reporting success, each pointing out the failures and dangers of the other two, all with their mortality. It would seem that in reviewing these criticisms and objections, that most of them had been made from personal observations, rather than by observation coupled with a scientific laboratory and post-mortem check on man and animals. It is this seeking after the truth concerning the operative tubercular and all forms of anesthesia that we would urge upon all those having access to experimental laboratories. The truth, when found, shall free us from the traditions of our profession and the laity concerning the "tubercular and anesthesia," and give us a rational basis for a choice of anesthetics in these cases. The work of E. Zueblin,[7] J. B. Rogers, and others, is along the right line, but there remains yet *so* much to be accomplished.

ETHER ANESTHESIA

It is worthy of note that the first patient operated upon under ether anesthesia was a "man tall and feeble, with tubercular heredity." Since October, 1846, surgeons have been operating tuberculars under ether. Those who are satisfied with the results of this method may be said to have achieved their success through three factors: First, a careful examination and selection of cases; second, an expeditious, adaptable operative technique; and, third, skillful anesthesia. These three are indispensable to success; the inability to apply all of them explains an upward mortality curve, and is responsible for continued search after methods. We know a surgeon operating largely upon tuberculars, who requires that they be given a careful physical and x-ray examination before operation, and another six weeks after operation. It is his opinion that ether, when properly administered, is not detrimental to tubercular cases. His opinion is concurred in by a considerable number of excellent surgeons. There are others like Hedblom[8] who admit that "tuberculous patients are relatively poor operative risks." Witherhill, of Denver,[9] in discussing pulmonary and cardiac sub-standard risks, operated under ether, said: "I should never refuse an invalid a necessary surgical operation because he happened to have a heart lesion, or even advanced pulmonary tuberculosis." There are men like Archibald, Ochsner, De Costa, Leonard Freeman, and others who believe that ether is responsible for activation; others who hold it responsible for pulmonary hemorrhages, recent and remote, as well as being the cause of pneumonia and various organic parenchymatous degenerations.

ETHER OIL COLONIC ANESTHESIA

Realizing the limitations of ether anesthesia in pulmonary troubles, many began looking for safer modifications and combinations. The possible advantages of ether colonic administration in

the presence of latent bronchial and pulmonary inflammations was suggested by [9]Dr. L. W. Bacon in 1906. Experimental work had been done before this, but the real progress in the United States will be associated with the names of Sutton, Gwathmey, Baskerville, Wallace and Lathrop. They have perfected a technique of administration whereby the "synergistic action of drugs"[11] employed gives the desired anesthesia. Lathrop[10] states: "The value is undoubted in cases in which absorption must be minimized on account of some lung, heart or kidney lesion." Again, that, "Wallace made a study for one hour, by sphymographic tracing, of a number of animals under ether-oil anesthesia during which the pulse and respiratory tracings never varied. This fact has been well demonstrated in many hundreds of patients surgically anesthetized by this method, in whom without any supplementary anesthetic, the pulse, respiration, reflexes and blood pressure all remained constant." Gwathmey, in discussing Lathrop's paper, said: "It is one of the safest methods. The margin between full surgical anesthesia and a toxic dose is greater than with any inhalation method. It is one of the most pleasant methods for the patient, as attested by the fact that those who have tried other methods prefer the colonic. A greater relaxation of the musculature exists than is usual with any inhalation anesthetic. A smaller amount of ether per hour is required than by any other method. The estimated amount is two ounces per hour, which seldom varies. An anesthesia deep at one time and light at another, is physiologically impossible. The brain is more completely protected against stimuli than by any method of inhalation anesthesia." Like all new methods, ether-oil colonic anesthesia is not always a success in the hands of the novice. Our experience with the method, especially in abdominal work in tuberculars, has not given that degree of relaxation so greatly desired, but we can bear witness to the small amount of ether required, and if this "exhalation" anesthesia shall be proven devoid of injury to the lungs and other organs, we shall endeavor to perfect our methods of administration and operative technique and adapt them to selected cases of pulmonary tuberculosis.

NITROUS OXIDE OXYGEN ANESTHESIA

Nitrous oxide anesthesia had its inception in obstretrical, dental and other short operations. Gradually it began to be applied to sub-standard risks; its popularity here has made it the frequent anesthetic of choice in operations upon tuberculars.

Probably the best known exponent and investigator of nitrous oxide oxygen analgesia, is Crile of Cleveland. The profession will ever be indebted to him for his scientific and painstaking researches in the nature, causation, prevention, and control of surgical shock. He states[12] that, "in our clinic we first employed nitrous oxide oxygen analgesia for bad risk cases of exophthalmic goiter, and have gradually extended its use to bad risk cases of all kinds, until now it is employed in approximately 90 per cent of all our cases. We have been collaborating with members of the anesthetic staff in our endeavor to perfect the technique of administration of analgesia as the greatest aid to surgery of which we can at the present time conceive, since by means of it the patient undergoes a pleasant experience and a shockless operation, and above all, because he passes through the operation with his internal respiration unimpaired, but with all his factors of safety undiminished." In lung surgery per se, Gwathmey's[13] conclusion in the A. E. F., was to the effect that the choice lay between ether and nitrous oxide. He further stated that full surgical anesthesia, which is "safe without preliminary medication, is unsafe following preliminary medication," to our mind a very important observation. These remarks need not be considered as contradicting his more recent views as previously quoted concerning ether oil colonic anesthesia, but rather as an observation in lung surgery in war. How the objections of "preliminary medication" have been surmounted, he presents in the Annals of Surgery for August. "Morphine and magnesium

sulphate synergistically used give good relaxation when supplemented by (a) nitrous oxide oxygen to abolish consciousness and for its added analgesic effect; (b) or by using a local analgesic for the skin and peritoneum."

J. T. Halsey,[14] of Tulane University, believes that nitrous oxide anesthesia should be used whenever possible in all tuberculosis cases as a precaution against lighting up or aggravating pulmonary lesions, which is a real danger if ether is used.

Archibald, of Montreal,[15] who has probably operated more pulmonary tuberculars than any other surgeon in America, has some very excellent ideas concerning the anesthetic. "First, it is important to choose an anesthetic that will do the least harm to the lungs. Gas oxygen undoubtedly fulfills best this requirement; morphine and atropin are given half an hour previous to operation, and novocain is freely used to help out the gas."

The author has analyzed the operative results with regard to the effect of the anesthetic upon the lung condition, and has found that in the few cases, eight or ten, where ether was used, there was a much higher percentage of anesthetic ill effects than with gas-oxygen. Indeed, the latter, in his experience, never has any obvious immediate effect on the lungs.

While it is obviously necessary to avoid the irritating effects of ether upon the pulmonary mucosa, one should also remember that the rapid and deep respiratory movements of induction, as also any violent exertion of the patients on the operating table, must be equally avoided.

Undue physical exertion is bad for a tuberculous lung. Consequently, the author dies not hesitate to ask the anesthetist to add sufficient chloroform to the gas-oxygen to get the patient quiet. "I have lately come to the conclusion, having regard to the somewhat forced respiration which is frequently seen during the induction of gas-oxygen anesthesia, that it would be better to begin the anesthesia with chloroform, administered very slowly and quietly, and then to continue with gas-oxygen as soon as the patient has passed the stage of excitement. In any case, the quietest anesthesia possible is essential. Chloroform throughout is not advised."

LOCAL ANESTHESIA

Allen, in his work, "Local Anesthesia,"[17] cogitates upon general anesthesia versus local anesthesia, thus: "Had the position been reversed and local anesthesia been discovered first, general anesthesia might now be struggling to displace it from its pedestal, and it is not to be doubted but that local anesthesia would have reached a much higher plane of development, for in all operations it is suited to safety and comfort." Professor Matas, writing the introduction to Allen's work, speaking of general versus local anesthesia, says: "The problem of shock, the secondary nausea, and vomiting, the pulmonary complications, embolism and thrombosis, and above all, the degenerative auto-intoxications following the action of these somatic poisons on the eliminating and other organs still remains to be reckoned with * * *. Combinations of novocain and adrenalin in various isotonic dilutions—by practically eliminating the toxicity of the analgesic, increasing its stability, durability and intensity—have so expanded the technique that in the hand of an expert, peripheral analgesia may be made to encompass in its grasp almost the entire domain of operative surgery."

Bartlett,[18] in a very fair summary of indications for local anesthesia, says: "The indications for local anesthesia are far from universal. It depends, first of all, upon the ability and inclination of the surgeon, to say nothing of the condition and attitude of the patient, as well as his age, race, training, and intelligence, all of which must be taken into consideration. Local anesthesia may be reasonably considered indicated in obstructive conditions of the air passages, inflammatory respiratory t r o u b l e, circulatory decompensation, acute abdominal emergencies, renal insufficiency, toxic conditions (goiter, etc.), chronic alcoholism, marked obesity, and very old age. The same is true

if a general anesthetic has been used in the very recent past, and if the patient must for any reason become ambulatory immediately after the operation."

REGIONAL ANESTHESIA

In this type of anesthesia the nerve blocking solutions are applied as nearly as possible to the origin of the nerve, or along the nerve trunk. Obviously there are many objections to this method, but as developed and practised by Professor Victor Pauchet, and advocated by Sherwood-Dunn,[19] doubtless it has a limited field in the hands of the expert.

SPINAL ANESTHESIA

This may be considered as a type of regional anesthesia, and while applicable to certain cases, has its distinct limitations in the tubercular. We did a little experimental work with this method in 1901, revived it again in 1904, allowed it to lapse, again revived it in 1920, but we never have acquired the confidence in the method so desirable in a safe anesthetic. A. S. Boyd and Carl C. Yount[25] have reported 6,229 operations with only four deaths, and one surgeon in New Orleans has had over 6,000 cases with only one death.

Dr. Oscar M. Schere, who has had much experience in operating tubercular in one of the Denver sanatoria, speaking of their chest surgery, says: "All of their operative work was done under spinal anesthesia, since their medical staff was opposed to the use of general anesthesia in these patients."

However, in the tubercular who is ever prone to that insidious complication, tubercular meningitis, headache and other centric disturbances, coming on from a few hours to five days after spinal analgesia, give the surgeon considerable cause for worry until the conditions disappear. Yet he who is master of the technique, need have no unnecessary apprehensions. It should also be borne in mind that the tubercular presents a local respiratory handicap, and should the anesthetic solution course so high as to involve the respiratory centers, we would have a most trying "accident" to deal with. When you let go of the plunger, you let go of your hold upon this type of anesthetic. Thereafter you must be able to direct its course by posture.

In the classification of surgical and anesthetic risks, we again quote McMechen: "In the present advanced state of surgical and anesthetic knowledge, the patient has a right to expect a fairly exact preoperative diagnosis, and a very exact preoperative prognosis. Skill in prognosis can only be gained by experience. The surgeons and anesthetists who make and record preoperative prognoses, and check them up with their results, will soon learn that the patient's physio-pathological condition, or reserve vitality, is the paramount factor in recovery.

A. H. Miller, of Providence, R. I., has classified operative surgical risks as follows:

A.—*Good Risks:* Patients free from organic disease, whose condition is not likely to prove fatal.

B.—*Fair Risks:* Patients suffering from organic disease, whose surgical condition is not especially serious.

C.—*Poor Risks:* Patients whose surgical condition is so serious, or so far advanced as likely to result fatally.

We would add a "D" class to cover many of our tuberculars—very poor risks—patients suffering from extensive organic disease where the surgical condition is especially serious.

The scope of this paper will not permit of a discussion of tubercular risks under regional surgery; that indeed would require a thesis in itself; but in passing we desire to call your attention briefly to the wonderful advances made in surgery of the chest during the war, and so successfully practiced since, in America by Willy Meyer, Archibald, Hedblom, and others. We note the lessened mortality when operating under positive pressure.[22] Hedblom's[23] timely conclusions concerning empyema must not be omitted. "The recognition of tuberculous empyema was often difficult. A history of a primary pleurisy with effusion seemed more often to signify a tuberculous condition

than did a pulmonary lesion, unless the latter was active and extensive. A tuberculous empyema might be present in the absence of clinical or x-ray evidence of pulmonary involvment. The typical microscopic picture in the sectional pleura, or the demonstration of the bacilli in the exudate might constitute the only evidence in such cases. A [12]tuberculous empyema not secondarily infected should not be drained, and should be aspirated only for a considerable accumulation of fluid. For a tuberculous empyema secondarily infected, either by operation or spontaneously, drainage was necessary. In the absence of bronchial fistulas and bleeding, secondarily infected tuberculous empyema might be markedly benefited by antiseptic solution treatment. The amount of fibrosis or other pathological change in the lung in such cases determined the degree of expansion of the lung, whether following antiseptic solution treatment or decortication. If the lung failed to expand in whole or in part, a several-stage operation designed to collapse the chest wall was indicated. Tuberculous patients were relatively poor operative risks."

The use of the x-ray for diagnosis in intestinal tuberculosis has made rapid progress; its routine use should be practiced; better diagnoses will then be made, and embarrassing situations at operations minimized.

Since the war, those of us working in Prescott have operated 150 cases who were tubercular, covering fairly well the range of general surgery. The anesthesia was distributed as follows:

Gas oxygen	16
Ether inhalation	19
Ether oil colonic	43
Spinal	25
Local	47

We have endeavored to surround these sub-standard risks with every safeguard. We have constantly endeavored to adapt the anesthetic and the operation to the patient and ourselves. We have no optium method. Our experience is to the effect that nitrousoxide oxygen preceded by local anesthesia, with a slight ether sequence where absolutely necessary, as advocated by Crile, is the best suited to most of these cases. We believe that where it is possible, operations should be done under local anesthesia. In certain carefully selected cases, spinal anesthesia may prove of great value. Ether-oil colonic anesthesia requires more clinical and laboratory proof of its safety in tuberculosis, though in our limited experience (43 cases) we have seen no untoward effects upon the lungs or intestines.

The following points may be of service, when considering operation upon tuberculars:

1. Except in most urgent cases the history must be taken, and that part pertaining to the respiratory system developed to the fullest. The clinical picture of this risk must be brought up to date, and the previous damage of this disease must be knwn and rated.

2. We should elect to operate during a period of improvement,[24] endeavoring to secure this desideratum by approved methods in cooperation with the internist.

3. Clinical preparation—study of the temperature and pulse, x-ray, blood count and haemoglobin, urine examination, Wassermann, and blood pressure—should be made. The record of vital capacity and results of breath holding test will prove of value.

4. Team work is quite as much needed here as in the thyrotoxic cases. The internist, anesthetist, surgeon, assistants, and nurses in charge must work with intelligent cooperation before, during and after the operation.

5. The operating room should be kept at the proper temperature, no chilling of the patient should be permitted in the operating room or corridors. All the appliances for dealing with shock, and the accidents of anesthesia should be at hand and should be immediately serviceable.

6. The anesthetic should be that one, which after a careful estimation of the tubercular risk in consultation, offers the greatest advantages to the patient. (*Note*—In our sparsely settled districts, we often find it necessary to use the anesthetic which our anesthetist is most competent to administer.)

7. The pre and post-operative care of the patient should not be left to the general nurse, but he should be specialized by a nurse of the highest intelligence, surgical training, and fidelity.

8. The internist, anesthetist, or surbeon who has not time to determine the degree of risk and prepare to safeguard his patient accordingly, has no moral right to present for operation, anesthetize, or operate upon pulmonary tuberculars, when there are those available who will take time to safeguard these sub-standard risks.

In conclusion, we believe that it is up to the general practitioner to be able to recognize early those conditions which arise as truly surgical conditions in the tubercular, and to know that because his patient is a tubercular that he is not always to be deprived of the relief surgery would afford his non-tubercular patient. It is equally imperative that the tuberculosis specialist know these facts and more. To the surgeon must come the knowledge that the "poor risk" tubercular may be made a safer risk by careful and painstaking study, planning the operation for the patient, and not sacrificing the patient to an immutable technique. Finally, the profession must realize, as Samuel Robinson has pointed out, that:[4] "It is not until a balance has been reached between the internist's conservative lack of faith and the surgeon's sometimes dangerous leaning to experimental surgery, that progress occurs in the treatment of conditions which are acknowledged to be beyond cure by medication alone." I submit that this progress has come to the thyrotoxic case, and its principles, if applied generally by surgeons, will result in lessening the risk in the tubercular, and the "internist's conservative lack of faith" will be supplanted by a wholesome confidence in the possibilities of well directed surgery.

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SOME SIGNIFICANT PROBLEMS IN ANTI-TUBERCULOSIS WORK*

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The tuberculosis problem is not yet solved, nor apparently is it nearing solution. Notwithstanding the vast sums spent in the construction and maintenance of sanatoria, the large amounts of money and effort spent in popular education, the extensive propaganda carried on by all Anti-Tuberculosis organizations, the increased attention paid to this subject in the medical schools and in medical literature, and in the post-graduate courses for physicians, both at the sanatoria and independent of sanatoria, the death rate has not materially decreased, and the optimism of physicians and social workers so manifest two decades ago, has, to say the least, been much moderated. The hopeful attitude of the workers of that period is now seen, perhaps unfortunately, most frequently in the beginner and in the inexperienced. Our united efforts have not been entirely, however, without results. They have served to properly outline the problem—to bring its colossal size into true relief. We are beginning at least to realize its true magnitude, but we cannot as yet say it is solved.

In 1905, at the first meeting of the National Association for the Study and Prevention of Tuberculosis, now known as the National Tuberculosis Association, Dr. William H. Baldwin, in a most comprehensive article, called attention to the fact that there were, including some not yet constructed but assured, 135 institutions, both new and old, where tuberculous patients were cared for in the United States and Canada. In all, there were accommodations for 8,400 patients, of which 30% were in New York State alone. So enthusiastic were tuberculosis workers in those days that the construction of permanent sanatoria was considered inadvisable, since it was generally conceded that the disease would soon be eradicated. The budget for the National Association in 1905 was a little more than $10,000, and of all agencies engaged in Anti-Tuberculosis work approximately $100,000. I have been unable to secure satisfactory data on the number of beds available for tuberculosis patients in the United States and Canada at the present time. In the 1916 Director, however, is listed more than 3,100 different organizations and institutions engaged to a greater or less extent in Anti-Tuberculosis work. The budget of the National Association of last year alone was $180,000 and the budget for all Anti-Tuberculosis work in the United States exceeded $2,500,000. Every state has some form of organization to fight tuberculosis, as well as has every large city and many smaller centers.

The literature of the early periods abounded in articles advocating the establishment of sanatoria, the education of the physician, and the education of the laity. The "Winning Fight" was a very popular title presented on many occasions. Trudeau stated at a meeting of the National Association that there was a vast and great need for the education of the people, and through them the education of the state. He said: "It is evident that if every man and woman in the United States were familiar with the main facts relating to the manner in which tuberculosis is communicated, and the simple measures necessary for their protection, not only might we reasonably expect as a direct result of this knowledge a great diminution in the death rate of the disease, but the people would soon demand and easily obtain effective legislation for its prevention and control."

At the present time we have such articles as, "Is the Sanatorium Worth While?"; "Why the Continued High Death Rate?"; "After the Sanatorium, What?" Farm colonies and industrial

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communities for the tuberculous at the present time are subjects for special investigation. The National Tuberculosis Association workers are attempting at the present time to secure data on the advisability or inadvisability of establishing industrial and agricultural colonies, and the after care of rehabilitating the tuberculous patient. These ideas and movements have thier origin in the fact now becoming recognized, but only recently so, that our Anti-Tuberculosis work is lacking in permanent results.

It is my hope at this time to call attention to a few fundamental factors which seem to me, after some years of experience, to be worthy of more study and careful analysis than many of us have given them—factors which have their basis in the very nature of the disease, and in the psychology of the patient; factors which have to do with the cooperation of the patient with his physician and the proper employment of the opportunities given for his recovery. This is the problem presented by the patient himself. The problem that has for its complete solution proper advice at the proper time, and this thoroughly and properly followed. Absolute control of patients is certainly an essential factor in the work of the physician treating tuberculosis, but how completely can this be done, and how completely is this done. We might consider for a moment the typical individual ordinarily afflicted with pulmonary tuberculosis. He is not the very young nor the very old, but the young adult; not the phlegmatic nor the lazy, but the neurotic and industrious; not the individual accustomed to spend many hours in bed, or in complete relaxation, but the one accustomed to spending many hours in activity with but little relaxation; *i. e.*, the young adult just assuming the responsibilities of life, or reveling in its dissipations. Tuberculous patients are hard workers or hard players, or both, the striving, restless individuals who have done many things and hope to do many more. They are the physical bankrupts, such bankruptcy preparing the soil for the reactivity of the tubercle bacillus, which has, as we believe at the present time, been present since childhood, but which has at least been held in abeyance. When we consider the abrupt change, the great transformation which we as physicians in most instances are forced to advise in the life of such individuals we begin to realize the practical difficulties in the so-called control of our patients. We advise that a life of activity be changed to one of idleness; a life of motion changed to a quiet life, or life of rest; a life of seeing many people and doing many things changed to a life of seeing few people and doing little or nothing. Add to this the physical fact that the advance of the disease has not been sufficient to force on the individual the desire for rest, and we see the situation which I shall call Problem One, or *the problem of the incipient case.* We now can understand that oft-repeated and too familiar answer of the patient when told by the sanatorium physician that he must go to bed: "Stay in bed! I cannot stay in bed; I am naturally of a nerovus disposition, I must be active. You do not understand, Doctor, how much work I did." The patient does not feel the need of rest. He cannot grasp the fact that if tuberculosis is present the less he feels the need of rest the more effective rest will be taken; the more certain will be his recovery. Too often the physician becomes annoyed. He tells the patient to go his way. The patient becomes dissatisfied with directions given him and goes his way. The physician spends his time with those that are more tractable. The patient goes his way without supervision and without advice. They part company, and the physician feels that his duty has been performed. This, however, by no means solves the problem. Add to the above picture a second phase; one where proper advice is given and followed for a time and satisfactory improvement begun. The case is regarded as a favorable one and will in all probability go on to recovery. The routine, however, becomes irksome; the patient overestimates his ability for activity, disregards the advice he has previously followed, changes his attitude with reference to his physician,

and instead of asking his physician what to do, and trying in every way possible to follow his advice, tells the physician what he, the patient, intends to do. The twain have, as it were, exchanged places. Too frequently our sanatorium patients say to us, "Doctor, I am going to do so and so, what do you think of it?" One can always reply that as a piece of news such communication is interesting, but there can be really no reason for introducing it into a consultation of patient with physician. The decision has already been reached; no advice is asked. It is merely a communication.

It has been urged that cold facts and discouraging figures should not be quoted to early cases or to rapidly improving cases. We should not advise them that after four years 50 to 60 per cent of all cases having positive sputum are dead, and that after twenty years 70 to 80 per cent are dead of their tuberculosis. We should not do this because it destroys the optimism of these patients, and makes them less likely to fight a good fight, without which there will be no victory. It seems to me that something which would operate against the over optimism, certainly unwarranted optimism, in favorable cases might do much to improve the end results, which we all know are notoriously discouraging. Lawrence Brown says: "Many tuberculosis workers have great difficulty in grasping that pulmonary tuberculosis is a chronic disease, which temporarily responds rather easily in many instances to more or less efficient treatment. The patient also cannot grasp this phase of the disease." The physician spends too much of his time in therapeutic effort on the advanced and advancing case, and much too little advice is given the incipient. True it is, that an audience with a favorable case is oftentimes hard to obtain; they are not seeking help—and an audience with a far-advanced case is notoriously easy. The sicker the patient the more welcome the physician.

Problem Two, or the *problem of the unimproved or slightly improved.*

Briefly consider for a moment a typical case; the diagnosis is made at the proper time and a fully equipped sanatorium is available for treatment; a long residence in such a sanatorium is followed by discharge, improved or slightly improved. The outlook for recovery which was so bright on admission to the institution has undergone a complete change. His optimism has changed to pessimism. He has tried without result the established routine with perhaps special methods of treatment. Is it any wonder that he gathers his slender dollars and pours them into the hands of quacks and charlatans who promise, and oftentimes guarantee results. The propaganda spread broadcast among both physicians and laity that pulmonary tuberculosis is the most easily curable disease has done untold harm. Tuberculosis may be easily curable as an infection, and undoubtedly this is so, but most certainly it is not easily curable when it becomes a definite disease with signs and symptoms.

Problem Three, or the *problem of cases recovering without treatment.*

At first thought we should consider that recovering cases present no problem, but there are certain features regarding such cases that should receive consideration. We have all seen individuals who have disregarded advice or taken improper treatment, and yet recover. Many such instances I consider unfortunate occurrences. They certainly are so if one considers the ultimate aim to be the greatest good to the greatest number, as one so recovering oftentimes goes about giving advice, pointing to his own experience, and by so doing causing the death of many others. Frequently I say, "If a thousand men should jump from a high building perhaps two would escape unhurt. Would these go about and say, this is a perfectly harmless procedure?" Perhaps two of the thousand recover under such conditions as mentioned above. They do the talking and forget the 998 long since silent.

To resume briefly, the insidiousness of the onset of tuberculosis, (for early cases and favorable cases are not sick in the ordinary acceptance of that term); the chronicity of tuberculosis, and length of time necessary for the

patient to remain under supervision; its periods of temporary improvement which produce a feeling of well being and desire for activity not commensurate with ability,—thereby oftentimes paving the way for a relapse,—make the so-called control of the favorable case a most difficult matter. Add to this picture, the picture of the poor unfortunate who fails to improve even with proper treatment and forsakes it because of no results, and then seeks the charlatan who promises results, and by so doing discredits the entire tuberculosis movement, taking with him to his ruin many others who might have been saved. Add to this, further, the individual who secures a good result in spite of no treatment, or improper treatment, not because of it, and yet persists for years in killing his friends by citing his own experience. These, then, are our three problems.

With our enlarged facilities for combatting tuberculosis, with the great increase in the number of beds available for these sufferers, perhaps at least a fractional part of our poor results are due to our inability to secure the cooperation of the patient in making the best possible use of the facilities at our command. The entire matter might well be summed up in the old saying, "When you tell a man to do a thing you are just half done; the next thing is to make him do it." We have many ininstitutions, we have physicians capable and willing to exercise the proper supervision for as long as it is needed, and the retarding factors in many instances are found in the patients themselves.

DISCUSSION

DR. LUCKETT: The author of the paper indicated that the death rate from tuberculosis was not being materially reduced. In Massachusetts they have kept accurate vital statistics for fifty years. There has been a steady decline in the death rate from tuberculosis during that entire period, so that it is now about one-half of what it was fifty years ago. The interesting feature of that record, which bears out the Doctor's statement, is that after their tuberculosis society was formed and became very active in its educational work, the death rate continued to decline in exactly the same way that it had before. In other words, all of the activity conducted in a wholesale manner in the state apparently had no effect whatever upon the rate of decline.

On the other hand, in Framingham, Mass., for the last four years there has been an intensive health campaign supported partly by the city and partly by the state and largely by the Metropolitan Life Insurance Co. The idea was to conduct a demonstration of what might be done if every individual in a restricted area was reached by intensive, scientific health work. A report which I saw just last week from Framingham indicates that in that four years a marked reduction in death rate and in the incidence of tuberculosis has come about in that town. The chief activity aimed at tuberculosis in this experiment is to reach every individual and to secure what we call a life extension examination; regardless of whether the individual realizes whether he is sick at all, they induce him to take a complete and thorough physical examination. In that way a great many incipient tuberculars are unearthed which were not suspected by the patient and a great many of them have received treatment and been arrested.

There was one other matter that I thought of during the reading of the paper and that is the hereditary factor. That has been the subject of discussion for a great many years, and perhaps I am treading on dangerous ground, but you know "some people rush in" in such matters. Pearson, the foremost statistician in the world, has studied very carefully the correlation factor of tuberculosis. He has compared that with hereditary characteristics which we can accurately measure, such as stature, eye color, hair color—things that are concrete, easily measured and linked up in a hereditary chain, and he has been able to demonstrate that the children of tubercular parents have a higher incidence of tuberculosis, in exactly the same ratio that they inherit eye color from their parents. That has not been carried very far. This objection may be raised, that these children are, of course, exposed. The environment is unfavorable but that has not seemed able to explain the facts that have been brought out. With the information that we have at hand, I believe that when we are consulted by tuberculous individuals as to the advisability of bringing children nito the world, that we ought to ing children into the world, that we ought to much danger of their children acquiring tuberculosis as for the general run of children in the community among all individuals, both tuberculous and non-tuberculous. I think we are justified from the statistics we have in going that far at the present time regardless of how we explain the incidence.

DR. PETERS: The longer we treat tuberculosis, the closer association we have with tuberculous individuals, the more we realize the truth of Dr. Giese's statement and the more it comes home to us that tuberculosis is not a curable disease. I believe with Dr. Giese that the pendulum of optimism has swung too far, and that people in the past have been encouraged when they have been told they are tubercular, with the idea of an easy and a quick

cure. I doubt very much if statistics—those lying things—would ever show us cures if the cases that are reported as cures did have it in the beginning. It is like the cancer proposition that the quacks treat. We get many cases of so-called incipient tuberculosis that probably never had clinical tuberculosis at all. It is an easy thing for an x-ray specialist or a man doing chest work, to find an individual who consults him and says he is a little run down in health—that he has tubercles, and make a diagnosis of tuberculosis. That individual is sent to a state sanitarium or private sanitarium, and in six months he is well because he has changed his routine and been put on a sensible diet, and he is better. That individual nine times out of ten did not have tuberculosis.

We have educated the medical profession to the point that they are so afraid they won't diagnosis tuberculosis in the incipient stage, that they are making lungers out of everybody. It is a mistake. I like to have them under observation for a length of time, to be sure I am not telling a tubercular individual to go his way. and later have him break down with chronic tuberculosis; and, on the other hand, I don't believe it is necessary to fill institutions with that kind of individual when he could be kept under observation and given some instructions, and he probably would produce the same results.

When a person reaches the stage where a safe and sound diagnosis of tuberculosis can be made, he is a chronic consumptive. I don't believe there is a medical man living, no matter how well he may be versed in chest diseases, who can make a diagnosis of tuberculosis when it is incipient. When it is possible to diagnose tuberculosis as tuberculosis, it has passed the incipient stage. When it has passed the incipient stage, that individual has reasonable chances for a life for years to come in good degree of health. Dr. Giese is very fortunate; he can talk about these pessimistic statistics because he never had tuberculosis. I hate to think about them but I know they are true.

I hope the time is coming when such methods as they are carrying out at Framingham can be applied to the whole country. It is not a pleasant thought, especially for one with chronic tuberculosis as I have, to feel that we ought all to be eliminated from existence, but nevertheless if we are ever to eliminate tuberculosis as a factor in civilization, we must corral all the consumptives in the world and sidetrack them until they are dead, or they are bacilli free. If we cannot do that, I see little hope of decreasing the morbidity of tuberculosis.

Dr. Luckett spoke of the decrease in death rate. We have decreased the death rate of tuberculosis but God knows whether that is a good thing. We have lifted the morbidity some, and these people are traveling the highways and byways and infecting the coming generations. The trouble with the educational campaigns heretofore conducted by the National Association and the State Associations and various other tuberculosis organizations, is that they put the cart before the horse. They attempted to teach the active consumptive how to care for himself, but they didn't pay any attention to his family or children. The keynote of success in tuberculosis is keeping infection away from children—that is where the danger lies. When we come down to this question of heredity, I cannot see that Pearson has spelled anything. If you want to come down to eugenics, it would be a delightful thing if we could make human beings—we might produce a race of superhumans. You take a consumptive and let him propagate children and that child naturally is an offspring from an inferior individual, and the child is susceptible to tuberculosis by nature no more so than it is to a thousand and one other ills. The real reason they get tuberculosis is because they are associated closely with active. Of course, they get it; they can't help it. If the good Lord is kind, he gets tubercular meningitis and dies in infancy; if not, he lives and breaks down later on in life when he ought to be producing.

I feel very keenly on this subject and I am not optimistic as to the results. People, as Dr. Giese has pointed out, are too prone to rush into active life when they feel well. It is a mistake for the average consumptive to think he is well when he feels fine. If that individual could be kept under careful supervision for two or three years after he feels well, then we could expect him to live for a number of years and be at least 70 per cent efficient. I tell my patients when I discharge them as arrested cases, if they will consider they are 70 per cent efficient instead of 170 per cent, maybe they will live; I don't know.

DR. HARRIS: I think Dr. Giese has stressed the biggest factor in the tuberculosis problem, and that is cooperation between the physician and the patient, if we can only find some means of making the patient do as we wish, as we advise him. Our percentage of relapses runs somewhere about 40 per ecnt—between 38 and 40 per cent. That means that two out of every five patients who were discharged as recovered, with wage-earning capacity, broke down, usually within a couple of years, and I think the biggest factor in bringing about this enormous percentage of relapses is the lack of intelligent cooperation between the patient and his physician. If we could only keep them under our thumbs, as Dr. Peters suggests, for at least two years after active symptoms have subsided, I think our net result would be a good deal better.

DR. GIESE: I thought perhaps someone was going to ask me how we could overcome these problems. A great many years ago I remember hearing a very famous man, Senator Tillman of South Carolina, talking about the problem of the colored man in the south, and outlining very definitely what the white man was going to do, what he had done, and what he intended to do, and when asked what should be done, he said, "I can tell you nothing."

It seems to me these things that I have mentioned are absolutely inherent in the nature of the disease and in the nature of the people having the disease, and they are things that I doubt very much if we are going to make any better. I don't want you to feel that I am always so pessimistic about the future but we have had in Colorado Springs during the last few years some very interesting statistics. Of all the institutions of the United States which can follow their patients most successfully, the Modern Woodmen perhaps is situated most advantageously. They know whether their patients are living or dead and what they are doing in about 98 per cent of the cases. These facts that I mentioned about cases dying were largely from that institution.

They found that of all their patients having tubercle bacilli in their sputum, after four years 60 to 65 per cent were dead. Now if that is true of patients having from six to nine months' proper sanatorium treatment, you can easily imagine what it would be in patients who do not have sanatorium treatment.

I keep away from the feature of not being able to take treatment. It is useless to advise a patient to go to a sanatorium when there is no sanatorium available. They cannot pay for it and there is no free one available. That, of course, decreases the number of cases that should be under treatment. The point I wish to stress is this—that with the facilities at our command, the sanatorium and men capable of treating tuberculosis, etc., we are not securing as good results as we should secure.

The key to the whole situation was brought out by Dr. Peters when he said that as far as we know now, when clinical tuberculosis develops, we have then a chronic disease which may or may not partially recover but which certainly will not recover without a long period of treatment. The only thing, then, that can be done is to prevent the development of clinical tuberculosis. It is true, certainly, what he said that we in sanatoria get a very large percentage of cases that are not clinical tuberculosis. Some of them come, too, from men of considerable experience. They feel they ought not to pass by these cases that have lost weight and perhaps have a little fever, but there are many other things that will produce the same things exactly as incipient tuberculosis, and the good reports made by many of our sanatoria are not bolstered up by the finding of tubercle bacilli in the sputum.

DIABETES AND SYPHILIS: *Mason*, Amer. Jour. Med. Sci., Dec., 1921, reports two cases of nonspecific positive Wassermann reactions in diabetics, in whom arsphenamine injections were followed by aggravation of symptoms, diminished sugar tolerance. Of these two cases, one was a child of five years and the other a young woman, 19 years of age. In neither was there evidence of syphilis or history of possible infection.

However, the work of Warthin and Wilson makes one reluctant to accept the ruling out of syphilis on the basis of absent clinical evidence. The work of these pathologists in demonstrating the lesions of syphilis in diabetics, even to the finding of spirochetes in the myocardium in the bodies of patients in whom syphilis had not been suspected, is calculated to make any clinician pause and consider before declaring that a positive Wassermann is non-specific.

Rosenbloom (Amer. Jour. Syph., Oct., 1921) has studied the coincidence of diabetes and syphilis, his material consisting of 139 cases of diabetes. Of these, sixteen showed positive Wassermann reactions, three of whom were without any clinical signs which would suggest syphilis.

Warthin's contention (Amer. Jour. Med., Sci., 1916, p. 157) that latent syphilis is the chief factor in the form of pancreatitis most frequently associated with diabetes, has met with vigorous opposition on the part of several writers, one of the most recent being Lemann (Amer. Jour. Med., Sci., Aug., 1921), who investigated the incidence of diabetes among negroes admitted to the Charity Hospital in New Orleans. The high incidence of syphilis among this class of patients is well known, but the incidence of diabetes is markedly lower than among the whites. In the admissions for the decade of 1910-19, the negro admissions were 43% of the total, but of the cases of diabetes, only 30% occurred in the negro. Lemann concludes that either there is no relation between the incidence of diabetes, or else there is an unexplained immunity of the negro race to syphilitic pancreatitis analagous to his immunity to locomotor ataxia. He, himself, inclines to the former opinion.

THE DIAHHRAGM IN PHYSICAL DIAGNOSIS*
(Diaphragmatic Pain)

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A wide variety of pathological conditions in the chest and upper abdomen markedly alter the position and movements of the diaphragm. By careful observation, by no means a difficult matter, information of the greatest diagnostic value may be obtained, information not diagnostic of the diseases themselves but of changes in the conformation of the dome of the diaphragm which they effect. We are indebted to Dr. C. F. Hoover of Cleveland for his studies, the first of which appeared in 1913, which have aroused interest in this subject and the reader is referred to his finished article in Oxford Medicine.

The diaphragm actually consists of two muscles, separately innervated, which arise from the xiphoid cartilage in front, the lower six ribs laterally and the lumbar vertebrae behind. The fibres converge to their insertion in the large central tendinous area which is somewhat fixed by its attachment to the pericardium. The shape of the diaphragm (Fig. 1, A) is that of a somewhat unsymmetrical and flattened dome, the summit of which on expiration is on a level with the fifth rib on the right and the fifth interspace on the left side. The arch is much less in that portion attached to the ensiform and ribs near the median line in front. The arched position is maintained by the negative intra--thoracic pressure and the positive pressure of the abdomen. On quiet respiration the lower portions of the diaphragm, especially at the sides and behind, are in apposition with the chest wall, separated therefrom by two layers of pleura, diaphragmatic and thoracic, between which is the complementary pleural space. This space is filled in the normal only on deep inspiration by the descending lung margin. The motor nerves of the diaphragm are the phrenics, from the third, fourth and fifth cervicals. The phrenics also carry sensory fibres supplying the central portion of the muscular sheet, an important matter in the study of diaphragmatic pain to be mentioned later. The phrenics are also the sensory nerves of the pericardium. The outer rim of the diaphragm derives its sensory nerve supply from the sixth to twelfth intercostals.

Two factors exist in the increase of volume of the thorax on inspiration; first, contraction and resultant descent of the diaphragm, and second, contraction of the scaleni and intercostal muscles which produces elevation and outward rotation of the ribs. These two muscular activities are in opposition as regards their effect on the ribs to which the diaphragm is attached. That is, the contraction of the diaphragm tends to draw the lower ribs inward while these ribs are actually drawn outward by the preponderant, antagonistic action of the intercostals. This movement of the ribs has been compared by Keith to that of a bucket handle; being attached at front and back the greatest movement is laterally. Thus in the normal there occurs on inspiration a widening of the sub-costal angle with an outward and upward movement of the rib margins.

Let us suppose that the height of the diaphragmatic dome is altered. If flattended (Fig. 1, B), the muscle is placed in a position of greater mechanical advantage and its tendency to draw in the rib margins is increased. This is due to the fact that if the fibres are less curved they are able to exert more traction at their attachments. If this flattening is great enough then the diaphragm will overcome the opposing action of the intercostals and on inspiration the lower ribs will be drawn in and the epigastric angle narrowed. On the other hand, if the dome is raised to a higher position, (Fig. 1, c), the opposite effect is produced, the dia-

phragm is more curved and its tractive costal muscles are less opposed and ineffect on the ribs is lessened, the intercrease in the inspiratory flare of the ribs occurs. This alteration in the position of the diaphragm may be unilateral, consequently, the movements of the rib margins may be altered on one side only. Furthermore, the arch being flatter in that position arising from the ribs near the median line anteriorly, depressions or elevations in this area have greater effect on the movements of the ribs. With depressions here the rib borders close to the median line may be drawn in, while lower down they show their normal outward movement.

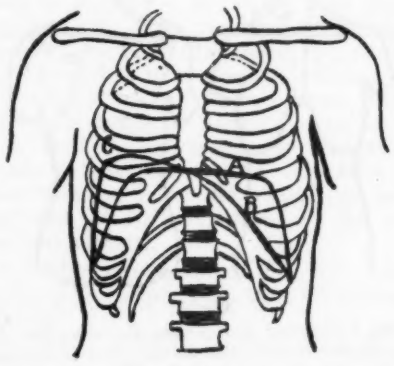

Fig. 1.

Line A—Normal position of diaphragm. Rib margins move outward.

Line B—Low position of diaphragm. Rib margin moves inward.

Line C—High position of diaphragm. Outward movement of ribs exaggerated. (After Todd.)

In studying the movements of the rib margins inspection and palpation are combined. The patient is placed in the recumbent position with chest and upper abdomen bared. The hands of the examiner are placed on the lower antero-lateral part of the thorax with fingers slightly flexed so that they rest on their tips on the lower ribs. The thumbs lie along the margins of the ribs pointing toward the ensiform. The patient is directed to breathe slowly and fairly deeply. The movements of the ribs as transmitted to the hands are both seen and felt. Practice in this method of examination will enable the examiner to detect even slight variations from the normal outward movement.

Conditions in which the lung volume is increased will depress the entire diaphragmatic dome and alter or even reverse the normal movements of the rib margins. This is seen typically in emphysema and in the paroxysms of asthma. Given an asthmatic patient with failing heart, a condition in which conclusions from examinatoin of the heart are most difficult to draw, examination of the rib movements will serve to determine how much his cyanosis and distress is due to circulatory failure and how much to bronchiolar spasm. Flattening is produced by pneumothorax, pleural effusion and tumors. Observation of the movements of the ribs will sometimes decide the often difficult differential diagnosis between thickened pleura and pleural effusion and between pleural effusion and massive consolidation. Signs of flattening of the sub-cardial portion of the diaphragm are of very considerable value in the diagnosis of pericardial effusion. Here alteration in the movements of the rib margins near the median line occurs, the movements at the sides being unaffected. The rib movements in pericardial effusion are also of value as a guide to tapping. If there is sufficient fluid in the pericardial sack to impede diastole, inspiratory narrowing of the sub-costal angle occurs. Great enlargement of the heart exerts a like effect depending on what part of the heart is enlarged. Dilatation of the left ventricle flattens the diaphragm to the left of the median line; the effect of right sided enlargement is more evident on the right.

Elevation of the diaphragm and increase in the effect of contraction of the intercostal muscles, *i. e.*, exaggeration of the outward movement of the rib margins, is seen sometimes in patients with old pulmonary fibrosis. In these outward movement of the ribs takes place, provided the diaphragm is not adherent to the chest wall. In the latter case the diaphragm has what amounts to a new attachment and, its

fibres now being less curved, will exert a greater pull, so instead of moving outward the ribs are drawn in. The diaphragm is also subject to elevation by pressure from below by tympanites, ascites, sub-phrenic abscess, enlargement of the liver, tumors of the stomach, spleen, etc. In sub-phrenic abscess increase in the outward movement of the ribs may be the sole physical sign which serves to locate the fluid below the diaphragm and to differentiate the condition from empyema. In paralysis of the diaphragm, usually seen after trauma to the neck, the muscle remains in high position and the action of the intercostals is unopposed. The reverse occurs with paralysis of the intercostal muscles in some diseases of the cord.

In summarizing the changes in the movements of the costal margins it may be said that if movement toward the median line occurs there exists either flattening of the corresponding portion of the diaphragm, or paresis of the intercostals or adhesion of the diaphragm to the chest wall. Conversely, if the normal outward movement is exaggerated, there is either high position of the diaphragm or paresis of that muscle.

DIAPHRAGMATIC PLAN (Fig. 2)

The sensory nerves of the diaphragm, that is, the phrenics to the central portion and the six lower intercostals to the outer margin, also supply the contiguous pleura and peritoneum. For this reason pain due to irritation of the diaphragm and of its serous coverings must be considered as one subject.

Fig. 2.
Diagram of surface of diaphragm. Area of white represents portion innervated by phrenic nerves. Black area portion innervated by lower six intercostals. (After Capps.)

The effect of irritation of the diaphragmatic pleura has been worked out by Capps in studies of the pain in pleurisy and pneumonia and by mechanical irritation through a trocar in the course of chest aspirations. The pain produced by irritation in the phrenic distribution is a typical referred pain located in the neck, usually at the border of the trapezius, (Fig. 3) and in the distribution of the third and fourth cervical nerves. This area is quite tender and is surrounded by a hyperalgesic zone. The pain in the neck as the needle enters the pericardium on paracentesis is typical of phrenic irritation.

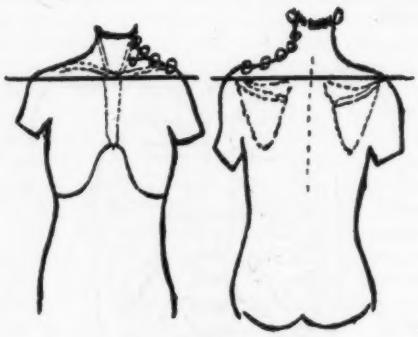

Fig. 3.
The horizontal line across the shoulders indicates the lower limit of the area innervated by the 4th cervical nerves. The circles show the common location of referred diaphragmatic pain. (After Capps.)

Irritation of the outer margin of the diaphragm produces pain over the lower thorax, epigastrium and upper abdomen. If the pain is severe, extension downward over the whole abdomen may occur. There is an overflow of the stimulus to cord segments lower than those irritated. If the seat of irritation is at the posterior margin the pain is felt in the lumbar region. This abdominal pain of diaphragmatic irritation is, like the pain in the neck, a true referred pain. The tenderness which accompanies it is in the skin and abdominal wall and while muscular rigidity is present to a certain extent these patients bear deep pressure better than those with inflammatory disease of the underlying viscera. In either neck or

abdominal pain the discomfort is augmented by strapping the chest since movement of the diaphragm is thereby increased; a tight abdominal binder may give great relief by the opposite effect.

Diaphragmatic pain referred to the abdomen has been a prolific source of diagnostic errors. Operations for appendicitis in patients who really had a beginning pneumonia have occurred in the experience of most of us. Study of the neck and abdominal pains of the tuberculous often reveals a diaphragmatic pleurisy. In sixty-one cases of diaphragmatic pleurisy studied by Capps, appendicitis was diagnosed incorrectly in nine cases, two of whom came to operation. Six cases were diagnosed cholecystitis with two operations. Gastric ulcer was diagnosed twice with one operation, liver abscess twice with one operation, and kidney stone, lumbago and brachial neuritis once each. This author suggested the following points in the differential diagnosis of pain referred from the diaphragm and that due to inflammation of the abdominal viscera.

1. The skin and muscles are more sensitive in pleural pain than in visceral disease.

2. Skin reflexes are more lively in referred pain as a rule.

3. In referred pain, deep pressure with the flat of the hand is well borne while in visceral disease it elicits a dull, deep pain.

4. In referred pleural pain, evidences of respiratory infection are usually present, namely, cough, expectoration, herpes, sore throat, high leucocytosis, rapid respiration.

5. Appearance of localized pain in the neck on the same side of the abdominal pain often reveals the true nature of the condition.

6. Referred pain in neck or abdomen is usually increased or induced by cough and deep inspiration. (To this should be added by belching.)

7. Nausea and vomiting are more constant in abdominal inflammation but may occur in diaphragmatic pleurisy.

CONCLUSIONS

Study of the movements of the diaphragm often give valuable information in diseases within the chest and upper abdomen. The normal movement of the rib margins on inspiration is upward and outward with widening of the epigastric angle. Depressions of diaphragm, localized or as a whole, place this muscle in a position of greater mechanical advantage and permit it to diminish or reverse the normal rib movement, depending on the extent and location of the depression. Elevation of the diaphragmatic arch produces the opposite effect, that is, increase in the outward movement of the ribs.

Exclusion of diaphragmatic inflammation is necessary in the diagnosis of acute surgical diseases of the abdomen. Pain in the diaphragm or its serous coats is referred to the neck when the central portion of the dome is involved, and to the lower thorax when the irritation is at the outer diaphragmatic margin.

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CONCERNING TREATMENT OF SYPHILIS*

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With the possible exception of the individual who devotes himself exclusively to the treatment of syphilis, no one is more truly qualified to treat it than the urologist. As specialists in diseases of the genito-urinary tract, you are naturally sought as specialists in this field also. Unfortunates suffering from this disease have a right to expect from you more intelligent management of their malady than they would receive at the hands of the general practitioner, the internist, or the general surgeon. In support of this contention, it is only necessary to mention one reason, and one organ, the kidney. Progress in urology has taught the other branches of medicine to recognize and be guided by the studies of kidney function. Is there one among you who will deny that the function of the kidney is synonymous with the safety of the patient under active antiluetic treatment? Then you must accept the responsibility which your pioneering carries with it, take up actively and openly the treatment of syphilis as yours, by right of superior ability, and bend your energies to making your position not only tenable, but secure. In adding the syphilitic to your clientele, you must prepare to give him better management than he can secure elsewhere, and, in order to make this preparation complete, you must broaden your horizon to embrace some of the qualifications of every specialty of medicine. The modern trend of medical education in the specialties tends toward narrowing rather than broadening along these lines. Men are trained as specialists in every line, and what is of more importance, practice as specialists, before they have an opportunity to try their clinical ability by the acid test of general practice. What is more conducive to the formation of a rut or a near-sighted vision? Let us grasp the opportunity which the syphilitic affords us to pull ourselves out of the rut into which too sharply limited practice may have led us.

Unlike the treatment of some other conditions which may be left to nature and a "bread pill," the rational treatment of syphilis presupposes that the disease is not a self-limited process and, in consequence, requires active treatment. The weapons with which we are armed are, in truth, two-edged. The activity of the treatment determines the fate of the patient. All of us have seen patients who have been over-treated, or who have received three doses of 606, a bottle of pills, and a "bon voyage." To divorce the syphilitic from his disease gracefully requires a deft hand which will effect the separation without doing him harm and will not leave him, minus his syphilis, worse than he was with it. He must be treated as an individual apart from his disease, and must be protected alike against the inroads of the spirochete and the harmful effects of the specifics. To the elder Keyes, we owe the truth that mercury, properly given, is not a poison, and because no syphilitic is cured without mercury, we should strive to perfect our knowledge of how properly to give it. Our training in recognizing early kidney damage is a long stride in making us superlatively qualified to pilot the good ship "specific." The kidney, however, does not always give the first warning of a shifting ballast. Loss of weight under treatment with mercury and arsphenamine, or with mercury alone, should give us pause. We may be giving too much, or not enough. If, with the loss of weight, the Wassermann is negative, and, what is infinitely more important, if the clinical symptoms are abating or have disappeared, we are probably giving too much. Then, before the kidney becomes damaged, stop the metal—to recommence it again when he is in condition to stand it. If,

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on the other hand, the disease seems to be progressing, and our patient is not standing the treatment well, as is evidenced by loss of weight or impaired kidney function, we must make every effort to discover why. So small a thing as an abscessed tooth may be the deciding factor which turns the tide against us, and against the patient, by way of his kidneys. It is not at all unusual to see an albuminuria clear up under mercury when damage to the teeth has been discovered by the x-ray and properly corrected.

Simply pulling an abscessed tooth will not correct the infection and necrosis at its root. While the teeth are being corrected, it is well to have the matter of anemia looked into by erythrocyte count and hemoglobin determination. Mercury should be withdrawn while the teeth are being treated, and this time is well spent in dealing with the anemia which is usually found to be present. Knowing these facts concerning the teeth, it is not hard to imagine that focal infection elsewhere should be looked for. Recently, a boy who had nocturia, frequency and some urgency by day, a urine loaded with pus and staphlococci, but a negative genito urinary tract, cleared up after an existing acne was properly dealt with. Another, a woman, developing temperature during convelescence from a pneumonia due to the bacillus mucosus capsulatus, was found to have a pyelocystitis from which the same organism was recovered. The kidneys of neither of these patients would have tolerated the added burden of eliminating very much mercury, yet either condition, more probably the acne of iodism, could easily have developed in the course of antiluetic treatment.

It seems superfluous to suggest that a careful history be taken to elicit genito urinary lesions which have been forced from consciousness by the dreadful thought of syphilis. Yet there is a recent post mortem record from the Massachusetts General Hospital, in which undiagnosed lesions of both ureters were the deciding factor in salivation and death from over treatment with mercury. Insufficient treatment, as far as correcting the syphilis was concerned, but too heavy a load for the damaged genito urinary tract to eliminate.

Mercury retained in the kidney pelvis and ureter will cause salivation. Mercurochrome was introduced into the kidney pelvis through a ureter which did not drain well, by the writer, in a non-syphilitic woman. Unmistakable salivation promptly resulted. After recovery, a smaller amount of the same salt produced the same result on two occasions which were undertaken as experiments, to strengthen the opinion that the damage done the kidney does not, of necessity, first take place in the parenchyma thereof. There was no demonstrable nephritis present; she had never been treated by mercury in any other way except a very occasional dose of calomel, none recently; and the salivation cleared up shortly after the color of the mercurochrome left the urine.

These facts would seem to indicate the wisdom of satisfying one's self that there is no back up against the kidney from any cause. Stricture or stone in the ureter is not any less frequent in syphilitics than in other individuals, and their results are apt to be more disastrous than is usual when the kidney is called upon to bear the burden of eliminating arsenic, mercury and the iodides. Gonorrhoea, with its possibilities of retention from strictured urethra or abscessed prostate, could reasonably be expected to be found often as a boon companion to lues.

Carcinoma was found in the bladder of a tabetic, whose only bladder symptom was incontinence.

Elliott and Todd (1) have shown that there is a small but positive tendency in normal individuals for the blood urea to rise and the phenolsulphonphthalein excretion to fall after the administration of mercury or arsphenamine. These laboratory findings have a clinical counterpart in the behavior of the urinary excretion after the blood urea reaches a certain level, probably first, in an increased output of high specific gravity, and later, a polyuria by night. Most careful attention to the renal function, using all the methods which we

have at our command, is often necessary to determine whether or not an existing irritation of the kidney is due to syphilis or to the exhibition of the specifics. What is sometimes thought to be a diabetes, with occasional sugar in the urine and a hyperglycæmia, has been proven, to the writer's satisfaction, to be the resulting retention phenomenon of a luetic kidney, which improved, and gradually disappeared under careful anti-syphilitic treatment.

It remains for us to determine at what point the physiological rise of the blood urea, and other retention phenomena, as well as the decreased output of phenolsulphonphthalein merges into the pathological. This is the heart of the matter. When urologists, generally, recognize their responsibility, and fix this point beyond question, the therapy of syphilis shall have made a large advance.

Since we have undertaken the treatment of syphilis, we must be alert for one very frequent pitfall. Lues attacks the lung, where it frequently complicates tuberculosis. To continue to administer arsephenamine to a patient who has pulmonary tuberculosis is frequently criminal. The size of the dose, and the interval of administration do not materially alter the result; neither does the stage of the tuberculosis nor the extent of the disease. This conclusion has been reached after having seen literally dozens of such cases die of a rapid tuberculosis following the administration of arsphenamine. When Watkins finished his first work on syphilis of the lung, it was thought that this was brought about by the rapid breaking down of syphilitic tissue, thus producing soil most favorable for the implantation of the bacillus of Koch. While this may be the process involved, we have seen a case in which there was no demonstrable, active tuberculosis, a negative Wasserman, and no history of syphilis, come to an untimely end, with hundreds of tubercle bacilli in the sputum after intravenous treatment with arsphenamine for widely disseminated Vincent's angina.

Several other arsenicals may be used intravenously in the treatment of syphilis complicated by tuberculosis, without the danger attendant upon the use of arsphenamine. Mercury may be used to good advantage if the resistance to tuberculosis is not lowered by too large a dosage. The iodides are contra-indicated on theoretical grounds, but may be given with less danger to the patient than he will incur from the continued use of arsphenamine.

In conclusion, then, let it be suggested that the successful treatment of syphilis depends on the ability of the kidney to excrete sufficient mercury and arsenic, without damage to itself. That this kidney function may be seriously interfered with by the presence of pus at the root of a tooth or elsewhere in the body. That after elimination of mercury by the kidney parenchyma, it may be held up in the genitourinary tract by some mechanical lesion and produce poisoning. That a careful history, and, in the presence of doubt, a cystoscopic examination, with ureter catheterization and x-ray, may be necessary to eliminate this complication. That a case of syphilis with nephritis should not be regarded as hopeless until the guarded administration of the specifics has shown that the nephritis is not leutic. That even in these cases, limitation of the protein intake will frequently enable the kidney to care for sufficient of the metals at least to arrest the syphilis. That arsphenamine, in some undetermined manner, produces a decidedly deleterious effect upon the lung of a syphilitic who has tuberculosis, and will cause his death if continued.

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PROTECTIVE MEDICAL MEASURES*

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The late World War revealed that the incidence of venereal disease among the people of the contending nations was much greater than even the best informed among us would have believed. And perhaps, the greatest benefits derived from the period of wanton destruction of human life and property was the knowledge gained which brought the nations to look upon venereal disease as a world Public Health problem.

The examination of recruits for the United States Army gave the startling information that 5.6% of the young men coming from civil life were found to be suffering from an active venereal disease. The selection of these young men was not confined to the slums and the frequenters of dives and questionable resorts, but they came from the rank and file and were the flower of young American manhood. In order to obtain and keep armies fit to fight, it was soon demonstrated that definite plans had to be devised and executed to combat and control venereal disease infection among the troops of the American armies.

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The United States was the first nation to present a definite, well-organized campaign against the spread of venereal disease both among troops and civilians. The measures taken were unprecedented, disturbing the social conscience in many instances on account of having to correct certain long established conditions which contributed to venereal disease infection. The country was at war, however, and the pleadings of the mercenary and immoral elements were promptly answered by being told to get busy and cooperate in the work to protect the soldier boys from the sins of the communities.

Facts and figures since compiled have not only corroborated what has been general medical knowledge that venereal diseases were markedly prevalent among civilized people, but far more so than was supposed. The fact that the war was over, and that the boys had returned home to resume civil pursuits, naturally caused a cessation of wartime activities along many lines of former welfare work. The activities in relation to the control and suppression of venereal diseases, however, were continued by the United States Public Health Service, the Interdepartmental Social Hygiene Board and the different State Departments of Health, working, as a rule, under a unified plan of cooperation and coordination. That much rehabilitative and constructive good has been accomplished cannot be denied, but in order to reach the goal desired, and that is necessary to make us a nation of physically fit people, the work so well begun must by all means be continued.

We are aware that any general plan to control effectively the incidence of venereal diseases must embrace protective medical measures, together with protective social measures, informational and educational programs and scientific research. Protective medical measures concern the prevention and treatment of venereal diseases, both from a medical viewpoint and, in a correlative way, all other measures contributing to medical lines of attack. The part of the program of attack against venereal disease which is of most concern to the physician is treatment. It is by proper treatment that infected persons are rendered non-infectious. Thus treatment is a matter of no little public concern and the physician who properly treats a case of venereal disease performs an important public service.

The principal diseases embraced in the great venereal disease plague are: Syphilis, Gonorrhea, Chancroid and Gangrenous Balanitis. The twin diseases, syphilis and gonorrhea, are the greatest offenders and are the problems we have to contend with and which we are endeavoring to conquer. A general consideration of the entire group is not intended, therefore, syphilis, the greatest offender, will be discussed to serve as a guide and to endeavor to show why the medical profession should consider the group known as venereal diseases, the greatest public health problem confronting us today. The responsibilities resting upon the medical profession in the campaign for the control of venereal disease are more exacting than applies to any other cooperating organization, in that we have the means at hand to treat them effectively and are in position to bring pressure to bear upon others to remove the contributing causes.

A disease so manifest and wide spread as to affect ten per cent of the population of the United States needs no introduction to the medical profession.

Osler styles syphilis as the greatest destroyer of the human race. From 8 to 12 per cent of all deaths are attributable directly or indirectly to syphilis, the majority of which, however, are reported as resulting from other causes, as heart disease, apoplexy, paralysis, locomotor ataxia, kidney disease, etc.

We know syphilis to be directly transmitted from parent to offspring. It causes approximately one-half of all abortions, miscarriages and still births. Eighty per cent of syphilitic parents die in early life and those who live add largely to the population of the various eleemosynary institutions.

Syphilis is contributing more largely to the reduction of race standard by the breeding of mental delinquents, moral degenerates and physically im-

paired than any other known agency. It is probably the greatest causative factor in inefficiency, insanity, pauperism and crime. Thousands of persons, while thinking themselves cured, are harboring the deadly spirochete in a latent state to be reckoned with later in life. Insurance companies have found that the death rate among people supposedly cured of syphilis to be double the rate of those who have never had it.

The above facts are brought out in order to emphasize the great responsibility resting upon the medical profession as custodians of the public health as regards these diseases, and especially those who treat them. It is imperative that every case of syphilis be effectively treated and otherwise handled according to the Public Health laws of the State, providing for the quarantine and treatment of venereal diseases. These regulations are specific, detailing certain duties and responsibilities both of local health officers and practicing physicians, also of legal authorities and the citizens of the State.

A sense of public responsibility for the venereal disease problem has taken a firm hold on people as a whole and it is up to the medical profession to fall in line in the campaign for their control or we will be severely and justly censured for our indifference.

There was recently held in Washington, D. C., the first session of the Venereal Disease Institute under the direction of the United States Public Health Service, delegates coming from both North and South America and the island possessions, aggregating more than five hundred leading men and women. The subject of venereal diseases was considered in such a broad manner that not only venereal diseases per se were considered, but a general survey of contributing causes of sex delinquency was comprehensively presented by means of lectures and discussions on biological, sociological, psychological, eugenical, pathological and hereditary factors. It is apparent that a general interest has been created in the venereal disease problems and with the facts of the ravages of these diseases known to the laity and with the successful demonstrations made in their control ever before us, it is a safe bet that we will never drift back into the state of indifference toward this group of diseases that obsessed us before the late war. It has been aptly said that "Our ignorance and failure in handling the venereal disease problem constituted the greatest crime of American civilization."

An abstract resume of what may be accomplished by utilizing established means and measures may be presented. The prevention of venereal disease infection should be the prime object of protective medical measures, and this may be largely brought about by application of the laws of personal and preventative hygiene, prophylaxis, scientific research and correlative protect ive social measures. Personal hygiene and constant moral introspection and habit are the most effective preventative weapons one can use against venereal disease infection. Live well and be well applies to venereal disease infection more forcefully than to any other communicable disease.

Medical prophylaxis, aside from the application of personal hygiene, concerns medical measures in which the sex offender may be furnished means by which venereal disease infection may be forestalled or obviated through the application of prophylactics, usually in the form of germicidal solutions or ointments. This procedure, as is generally known among medical men, is not a definite barrier that will invariably protect the sinner from reaping the consequences of his misconduct, but we do know, that when the proper means are used by trained hands, (the application of prophylactics within an hour of the time of exposure) venereal disease infection, which otherwise might occur, is markedly lessened. From a moral viewpoint there is possibly no basis for venereal disease prophylactics, but from a medical standpoint there is a distinct and valuable place for prophylactic treatment.

Another very important vehicle of prevention yet to be discovered but hoped for, is conferred immunity, active or passive. It is not known at this

time that immunity can be conferred but future experimentation may find a way to bring this hoped for discovery to a realization. This must come through the channels of scientific research, either through discovering a vaccine, serum or other media. Consider what an incalculable benefit would come from such a discovery, either as a means to confer immunity or to promote a more definite and rapid cure.

The clinical treatment of venereal diseases is, at the present time, in a much better regulated condition than at any time in the history of medicine. This fact is largely due to the United States Public Health Service acting as a unifying factor in cooperating and coordinating work of treating these diseases by the different State Departments of Health, and in aiding the states to establish clinics for the treatment of venereal disease by furnishing funds and personnel in many instances, that all might be treated effectively, along modern scientific lines. The proper training of physicians who intend treating venereal diseases will go far toward solving the problem of adequate, efficient treatment. A physician should not attempt generally to treat syphilis unless he has received special training. In no other disease is the treatment so exacting, requiring more patience and judgment. A physician who gives a syphilitic patient inadequate treatment because of the fact that the essentials of treatment are not thoroughly understood, deprives the patient of any opportunity to have his disease cured or arrested, thus fostering a great and irretrievable injustice upon the victim and perhaps other innocent individuals.

One injection of arsphenamine will not cure syphilis. It takes a long, well-administered course of treatment, stretching over a period of two or more years, to be reasonably certain of a clinical cure, even in the most favorable early cases. Some cases probably are cured in a shorter time, but there is no way of establishing the fact. Cock-sure cures often result in degenerative sequellae later on. Medical practitioners should be well enough schooled in the essentials of treatment to omit details; therefore, I shall not presume to enlighten you on this occasion.

A few words relative to handling the individual case might not be amiss. In treating syphilis, one has to keep constantly in mind that the patient is an entity, both clinically and physically, subject to idiosyncrasies and interpretations. A careful preliminary examination of the patient is necessary to determine the physical condition and discover possible contraindications for arsphenamine or mercurial treatment. A preliminary preparation of the patient is required before giving intravenous arsphenamine treatment. The preparation of the arsphenamine solution and the technique of operation is not concerned here but it is decidedly important that both be properly performed.

The fact must be constantly kept in mind that the patient's health must be carefully conserved and that such precautions as taking the blood-pressure, examining the heart, urine,etc., before each treatment be observed to guard against accidents and to insure the most favorable results.

It is needless to state that efficient laboratory facilities are absolutely essential to take care of the serological and bacteriopathological requirements. The laboratory is a most important adjunct in a program of protective medical measures dealing with venereal diseases and should be under the direction of trained, skilled workers. It is to be hoped that Arizona will not be long without a state laboratory equipped to take care of the needs of the state in this and other important matters.

In reference to public charges, it is important that the laws be observed in all matters pertaining to sex delinquency and venereal diseases, where laws or regulations are at hand for action and restraint. Inmates of state institutions should receive proper venereal disease treatment when found to be infected, to the end that the individual so infected be either cured or rendered non-infectious.

It would be of much economic value to industries to require that employees who suffer from venereal disease infec-

tion be promptly and adequately treated without financial handicap. It has been amply shown that the incapacity of the industrial workers so affected is a great economic burden on industry. Many large industrial establishments have already recognized the value of such a plan and are providing well-organized facilities for the treatment of these diseases among their employees.

We plan to interest the corporations in this state that are employing labor, in this matter, by bringing them to understand the disastrous effects of venereal disease on the health and happiness of their employees and the great economic loss sustained through impaired efficiency from the effects of this group of diseases among laborers.

Efforts will be made to induce every corporation employing a considerable number of men to designate one member of their medical staff to take care of all venereal disease cases among their employees; to encourage this physician to equip himself to treat venereal diseases scientifically and to furnish him with all necessary equipment and medicines for the treatment of venereal diseases in the most modern and scientific manner possible. If a plan of this kind can be consummated, we will have made a great advance in the control of venereal diseases within this state.

The public interest requires that every person suffering from a venereal disease, regardless of race, color or social position, be given adequate treatment, and I am not over-drawing the fact when I say, that the medical profession has it in its power to bring about this much needed result.

It is agreed that no one but a physician is qualified properly to treat venereal diseases. This is one branch of medicine that the Osteopath, Chiropractor, Christian Scientist, etc., fight shy of. This fact places an even greater responsibility upon the medical profession and it is a keener sense of this responsibility and a better preparation for the discharge of this duty that I am urging upon you.

It is a fact, I think, that physicians are disposed to take venereal diseases somewhat more serious than formerly. There are many yet, however, that look too lightly upon the question; and, as they do not care to, or refuse to, treat them, they are hindering the program by complacently washing their hands of the whole matter. That there are unpleasant features about the treatment of venereal diseases, we all admit; but the physician's responsibilities cannot be fully discharged either to the patient or the public by giving indifferent consideration and inadequate treatment to these diseases.

The physician who treats a case of venereal disease owes it both to the patient and the public to do the job well, if he undertakes it at all.

By giving the disease adequate treatment and the patient proper consideration, we can forestall much of the drug store and quack treatment that is now so prevalent and that is working such a great detriment upon the race in arrested but uncured cases of venereal diseases.

In urging universal treatment for venereal disease patients, we are not asking that physicians work without remuneration. My experience is that most victims can pay a reasonable fee. What we are urging, however, is that all be treated scientifically and where a victim is not able to pay that he should not go without treatment, thus be permitted to become a menace both to himself and the public. There should be an organized effort among physicians and the community to see that adequate treatment is placed in reach of every victim of venereal disease regardless of his financial conditions or social standing. The State Board of Health will provide the arsphenamine free for the treatment of indigent individuals who are suffering from syphilis in a communicable form. Certainly the community or some big-hearted physician should be sufficiently philanthropic to see that treatment is properly administered. In the larger centers of population there should be established public clinics for this purpose. In smaller communities and the rural districts, some modification of the clinic arrangement may be necessary. We have endeavored in this state, where it was not

possible or practical to establish clinics, to secure the consent of some physician to treat those who are not able to pay. Some forty public spirited physicians in the state have agreed to do this work and it is urged that you inquire at the State Board of Health for the name of such physician in your community, if you do not know already, and refer such cases to him and lend him your assistance and cooperation in this much needed work in every way possible.

In order to serve best the patient and the public, every physician should either give the best possible treatment or refer his case to one who will. The question, of course, arises ,to whom? It is realized that only the larger centers can support specialists. In this event a plan of partial specialization should be worked out by the physicians of the community or county by selecting one of their fellows who may be interested in this special line of work and make it possible for him to inform and equip himself for treating venereal diseases in a modern and scientific manner. Of course, he cannot expect to limit his practice to this line of work in the smaller communities, but by such partial specialization he can become an authority on the subject in his community, and patients may be referred to him by those who have not the time nor inclination to treat them, or he may be called in consultation in difficult cases. Thus qualified, he should be selected by the Board of Supervisors or the City Council, as the case may be, to treat indigent and jail cases and be paid a reasonable fee for his services. If the medical profession would thus encourage and recognize certain physicians in the various communities, I am persuaded that it would not be long before there would be sufficient men amply equipped in the state to place the treatment of venereal diseases on a sufficiently high plane and that nostrum venders and quacks would be robbed of much of their profits and a great public service rendered.

The plan here outlined is, I believe, practical and would work a great benefit both to the medical profession and the public.

It is incumbent upon the medical profession that the Protective Social Measures Program, in dealing with venereal diseases, be made as active and effective as possible, that physicians all take a common interest in the confronting problems concerned in the treatment and eradication of the great Venereal Disease Plague. While recognizing that the public interests are paramount to those of any class or group, doctors will do well to remember that we serve ourselves best by serving others.

NEW MEXICO

The first County Society in New Mexico to send in its report for the year 1922, to the State Secretary, was Eddy County, of which Carlsbad is the principal city. The President of this Society is Dr. M. B. Culpepper of Carlsbad, and the Secretary is Dr. C. Russell, of Artesia.

ARIZONA

The first County Society to send in its report to the State Secretary, in Arizona, was Coconino County. The President of this Society is Dr. A. H. Schermann, and the Secretary, Dr. E. S. Miller, both of Flagstaff. The Society has five members.

Southwestern Medicine

Published monthly by the Board of Managers of the four constituent societies.

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Information of interest to all readers, together with directory of officers of the constituent societies and the Board of Managers of this magazine, will be found following the Table of Contents on pages 1 and 2 of the Advertising Section.

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DR. WM. T. JOYNER, Roswell, New Mexico ..... Associate Editor
DR. W. WARNER WATKINS, Box 1328, Phoenix, Arizona ..... Managing Editor

THE MEETING OF THE TEXAS STATE MEDICAL ASSOCIATION

The Texas State Medical Association will hold its next annual meeting at El Paso, May 9-10-11. There are usually from 1,400 to 1,600 attendants at this meeting in the other parts of the state. It is anticipated there will be at least 1,000 this year. There will be a number of distinguished visitors invited to read papers.

The El Paso Medical Society is making elaborate preparations for the entertainment of the visitors and extends a most cordial invitation to the doctors in New Mexico and Arizona to be present at this meeting. It will be the only time in the history of the Texas State Medical Association when all the different sections, including the house of delegates and the general sessions have been able to meet under one roof. El Paso is the only city in the state able thus to accommodate such a large association. The El Paso county court house will have sufficient rooms and halls to do this without any of the meetings being held elsewhere.

W. L. B.

DEATHS

Dr. Chas. H. Tindall, of Yuma, Ariz., a member of the State Association, was accidentally killed recently, in an automobile accident. Dr. Tindall was a graduate of Chattanooga Medical College, class of 1905, and came to Arizona in 1919, locating in Yuma.

Dr. Chas. T. Dulin, of Tucson, Ariz., a memzer of the State Association and a Fellow of the American Medical Association, died January 20th, at his home in Tucson, of tuberculosis, terminating in meningitis. Dr. Dulin was an ophthalmologist, associated with the Arizona Hospital and Sanatarium. He was formerly in the United States Army, and located in Tucson about four years ago, after honorable discharge. The resolutions passed by the Pima County Medical Society are printed elsewhere in this issue of SOUTHWESTERN MEDICINE.

Dr. C. Hernandez Leon, of Tucson, a member of the State Association, and a fellow of the American Medical Association, died last fall, but report of this has only recently been received. Dr. Leon was a graduate of the University of the City of Mexico, class of 1896, coming to Arizona in 1913.

Dr. James Thomas Stone, of Corona, New Mexico, is reported to the journal as having died on November 18, 1921. Dr. Stone was born in 1881, graduated from Lincoln Memorial University, Knoxville, Tenn., coming to New Mexico in 1912.

IN MEMORIAM

In connection with the death of Dr. C. T. Dulin, of Tucson, the Pima County Medical Society adopted the following resolutions:

"Whereas, this society has been called upon to mourn the loss of our fellow member, Dr. Charles T. Dulin; and,

"Whereas, during the few years that he has been affiliated with this society—following patriotic and efficient service in the United States Army—Dr. Dulin has endeared himself to us by his kind and courteous treatment of his associates; by his deep convictions, his strict integrity, high character and sterling worth; and,

"Whereas, he has won the admiration of our profession and the entire community by his heroic struggle against the great 'White Plague'; therefore be it

"Resolved, That this society has lost a much-respected and valuable member; that this community has been deprived of the services of a skilled oculist—as well as of a loyal and useful citizen; and that a copy of these resolutions be forwarded to the family, also be spread upon the minutes of this society."

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

Southwestern Division

The second annual meeting of the Southwestern Division of the American Association for the Advancement of Science was held in Tucson, Arizona, January 26th, 27th and 28th, at the University. Dr. A. E. Douglas, of the Astronomical Department of the University, is President of the Southwestern Division, while Dr. E. C. Prentiss, of El Paso, is Vice-President and Chairman of the Executive Committee.

This was a very well attended and enthusiastic meeting, a long series of papers being presented in each of the three sections,—Physical Science, Biological and Social Science. The arrangement was very good, each section having an open session with papers, as well as a separate sectional meeting for the technical papers.

Among the notable papers in the Physical Science Section were the series of astronomical papers from the Lowell Observatory at Flagstaff, and the physical, chemical and metallurgical papers from the University Faculty. The first of these papers was the reporting of the finding near Flagstaff of crystals of terpin hydrate in natural state. Terpin hydrate is a synthetic substance and, until now, has never been found in nature.

In the Biological Section, which includes the medical sciences, several papers bearing more or less directly on subjects of interest to medical men were presented.

Dr. MacDougal, of the Desert Laboratory, spoke on the factors concerned in the growth and development of cells, illustrating his points with an artificial cell devised by himself and used in his work at his laboratory.

Dr. F. E. Clements, Associate, of the Carnegie Institute in Washington, spoke on the Changes in Climate and their effects on Life in the Southwest.

Dr. J. J. Thorrnber, of the Botanical Department of the Experimental Station, gave a very exhaustive report on the grasses of Arizona. This report will be of great value in future investigations on Hay Fever.

Dr. S. H. Watson, of Tucson, gave a paper on Hay Fever in the Southwest, substantially the same paper read before the meeting in Phoenix in December.

Dr. E. C. Prentiss, of El Paso, gave a paper on Gall Bladder Drainage.

Dr. W. Warner Watkins, of Phoenix, presented a paper on the Actions of Radium on Human Tissues, and A. M. Flagg, M. E., of Phoenix, wrote on the Sources of Radium.

Based on these two papers, a resolution was adopted by the Division, in general assembly, requesting the Government to take steps to conserve the available supplies of radium.

In the Social Science Section, a series of papers on Archeology were given by the faculty of the School of American Research of Santa Fe, N. M. In addition, there was an interesting paper on the Sociological Characteristics of the Southwest by Prof. Fred D. Merritt, of the Social Service Department of the University.

The three lectures were those of the President, Dr. A. E. Douglas, on The Annual Rings of Trees in Climatic Study; Dr. Henry B. Ward, of the Department of Zoology, University of Illinois, on The Struggle between Man and Wild Life in North America, an eloquent plea for conservation; and Dr. Edgar L. Hewitt of Santa Fe, on Native American Artists.

In the business meeting on Saturday forenoon,—Dr. D. T. McDougal, of the Desert Laboratory, was elected President of the Southwestern Division for the ensuing year, and Dr. A. E. Douglas was elected a member of the Executive Committee.

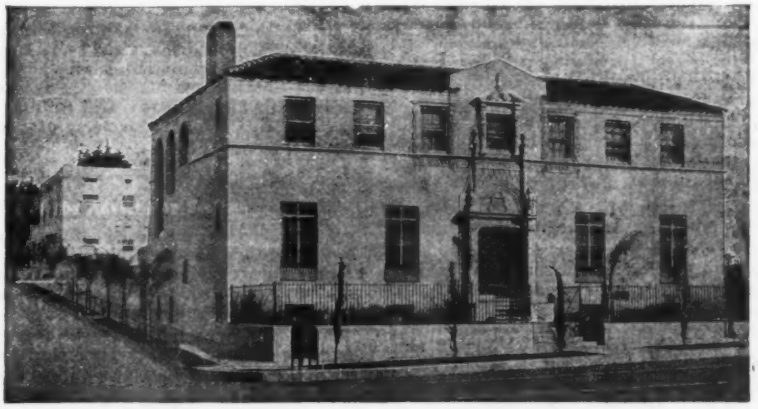
Santa Fe, N. M., was chosen as the next place of meeting, which will take place at the American School of Research. Some date in the Fall will be selected by the Executive Committee for this meeting.

MARICOPA COUNTY MEDICAL SOCIETY

(Arizona)

At their regular bimonthly meeting, held in the Society headquarters at Third Avenue and Monroe Street, Phoenix, the Maricopa County Medical Society voted to make their annual dues for the year 1922, fifteen dollars. This is exclusive of the state dues, which are ten dollars. This fifteen dollars county dues will cover rent on their quarters, provide funds for their library, moving picture films of surgical and medical clinics, and pay all their incidental expenses.

The quarters and library of this Society would be a credit to any medical society of a city of a hundred thousand people, and the Society is to be congratulated on their enterprise.



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REX DUNCAN, M.D.
Medical Director

EL PASO NEWS

Dr. Wirt Bradley Dakin of Los Angeles will address the El Paso County Medical Society at the regular meeting, February 6, 1922. His subject will be: "Operability of the Senile Prostate with Motion Pictures of Prostatectomy and Presentation of Specimens."

Dr. F. P. Miller is rapidly improving from a very severe attack of erysipelas of the face.

Dr. G. Werley is again in his office, after an illness of a week's duration.

Dr. S. L. Terrell, 514 Martin building, El Paso, was admitted to membership in the Society on January 3, 1922.

The following officers will serve the Society during the year 1922: President, Dr. R. B. Homan; Vice-President, Dr. T. J. McCamant; Secretary-Treasurer, Dr. E. W. Rheinheimer; Censors, Drs. J. B. Gray, F. D. Garrett and B. W. Wright; Librarian, Dr. E. B. Rogers; Associate Editor Southwestern Medicine, Dr. Paul Gallagher; Advisory Committee, Drs. J. Vance and H. H. Stark; Milk Commission, Mrs. G. Turner and W. W. Waite; Member of Affiliations Committee of the Southwestern Division of the American Association for the Advancement of Science, Dr. E. C. Prentiss; Legislative Committee, Drs. Paul Gallagher, T. J. McCamant and E. D. Strong.

The Society will hold a joint meeting with the El Paso Realty Board and the Association of Engineers on Friday, January 13, 1922, for the purpose of taking up the mosquito question in El Paso with a view to starting agitation which will result in suitable measures being instituted by the proper authorities to permanently eradicate the mosquitoes from this vicinity, where they have been a nuisance for the past two summers.

REMOVALS

Dr. E. J. Gungle, of Casa Grande, has removed to Tucson, Ariz., where he will be engaged in practice in the future. Dr. Gungle disposed to his practice and fixtures to Dr. James E. Redden, formerly of Patagonia. Dr. Redden is established in Casa Grande.

Dr. E. W. Hayes, formerly of Tucson, associated with the Arizona Hospital and Sanatarium, is now located at Banning, Calif.

Dr. T. J. Cummings, formerly Superintendent of the State Hospital at Phoenix, is now located at Clarkdale, Ariz., where he has charge of the United Verde Hospital.

Dr. A. L. Tilton, until recently of Kingman, Ariz., has moved to Los Angeles.

Dr. P. B. Newcomb, until recently in charge of the Los Angeles branch of the Pacific Wassermann Laboratory, has now taken charge of the laboratory of the Arizona Hospital and Sanatorium in Tucson. Dr. Newcomb was formerly pathologist at the State Hospital in Phoenix.

Information has reached the journal that Dr. C. E. Waller, of Santa Fe, a councillor of the New Mexico Medical Society, has moved from the state.

Dr. Albert Soiland, the well-known radiologist of Los Angeles, Calif., has removed his office and work rooms to commodious quarters at 1407 South Hope Street. He now has associated with him in x-ray and radium therapy, Dr. Wm. E. Costolow, formerly of the University of Pennsylvania.

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	Page
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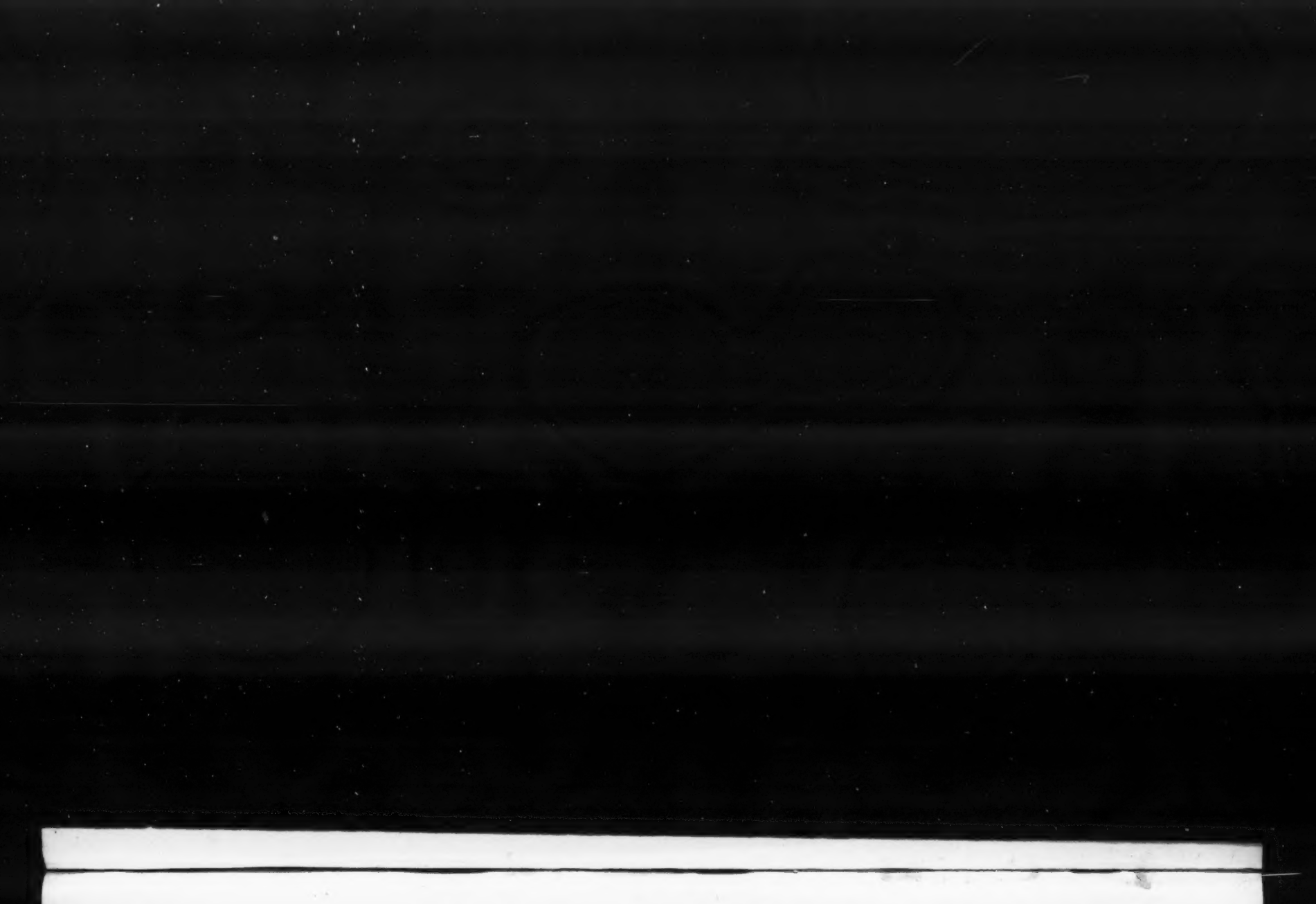
Fairchild Bros. & Foster	Cover
Goss Laboratory	4
Homan Sanatorium	8
Horlick's Malted Milk Co.	12
Hynson, Westcott & Dunning	12
Las Encinas	9
Maltbie Chemical Co.	15
Mead, Johnson & Co.	11
Mellin's Food Co.	14
McClure, E. H. & Co.	15
Parke, Davis & Co.	Cover
Pathological Laboratory	4
Providence Hospital	6
Radium & Oncologic Inst.	17
Scholl Mfg. Co.	13
Sherman, G. H.	15
Shortle's Sanatorium	8
Southwestern Surg. Supply Co.	14
Squibb & Sons	Cover
Storm, Katherine L.	12
Turner's Clinical Laboratory	7
Victor Elec. Corp.	Cover
Waite's Clinical Laboratory	7
Wilson-Millican	7
Winckley Artificial Limb Co.	16



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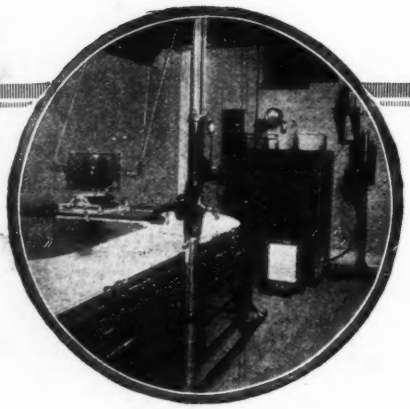

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